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PATENTS

January 29, 1985

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Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	64.00
Designation fee for 11th and subsequent designations	no charge

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Dec. 24, 1984.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 26, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,312,076 through 4,313,228

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Board of Appeals Decisions Rendered in the Month of Dec. 1984

Affirmed	122
Affirmed in Part	18
Reversed	51
Total	191

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,360,804, Re. S.N. 673,135, Filed Nov. 19, 1984, Cl. 340/703, PATTERN DISPLAY SYSTEM, Toshio Ohura, Owner of Record: *Nippon Electric Co., Ltd., Tokyo, Japan,* Attorney or Agent: Maurice E. Gauthier, et al., Ex. Gp.: 264

4,395,182, Re. S.N. 673,145, Filed Nov. 19, 1984, Cl. 414/299, FILLING AND DISTRIBUTION APPARATUS AND METHOD FOR SILOS, Donald W. Suwyn, Owner of Record: *Inventor,* Attorney or Agent: Merl E. Sceales, et al., Ex. Gp.: 317

Erratum

The Official Gazette of Sept. 11, 1984 contained an incorrect patent number in the listing of the "REISSUE APPLICATIONS FILED".

Incorrect Listing:
4,341,370, Re. S.N. 634,771, Filed July 26, 1984, Cl. 251/282. ATOMIC ABSORPTION SPECTROSCOPY, Clive Parker, et al., Owner of Record: *Inventor,* Attorney or Agent: Edward S. Irons, Ex. Gp.: 345.

Correct Listing:
4,341,470, Re. S.N. 634,771, Filed July 26, 1984, Cl. 356/307. ATOMIC ABSORPTION SPECTROSCOPY. Clive Parker, et al., Owner of Record: *Varian Associates, Inc., Palo Alto, Calif.,* Attorney or Agent: Edward S. Irons, Ex. Gp.: 255.

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,511,282, Reexam. No. 90/000,686, Requested: Dec. 12, 1984, Cl. 138/113, PRESTRESSED CONDUIT FOR HEATED FLUIDS, Glen P. Willhite, et al., Owner of Record: *Conoco, Inc., Ponca City, Okla.,* Attorney or Agent: Stephen A. Littlefield, Ex. Gp.: 243, Requester: General Electric Co., Washington, D.C.

3,999,756, Reexam. No. 90/000,676, Requested: Dec. 3, 1984, Cl. 273/73C, TENNIS RACKET, Howard Head, Owner of Record: *Prince Manufacturing, Inc., Princeton, N.J.,* Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 334, Requester: Prince Manufacturing, Inc., New York, N.Y.

4,226,728, Reexam. No. 90/000,698, Requested: Dec. 21, 1984, Cl. 252/8, FIRE EXTINGUISHER AND FIRE EXTINGUISHING COMPOSITION, Shin H. Kung, Owner of Record: *Pat Evans, Cleveland, Tenn.,* Attorney or Agent: Holland, Armstrong, et al., Ex. Gp.: 223, Requester: Keith D. Nowak, New York, N.Y.

4,232,679, Reexam. No. 90/000,700, Requested: Dec. 31, 1984, Cl. 128/419PG, PROGRAMMABLE HUMAN TISSUE STIMULATOR, Joseph H. Schulman, Owner of Record: *Pacesetter System, Inc., Sylmar, Calif.,* Attorney or Agent: Donald L. Cox and Robert R. Meads, Ex. Gp.: 335, Requester: Medtronic, Inc., Minneapolis, Minn.

4,270,596, Reexam. No. 90/000,696, Requested: Dec. 27, 1984, Cl. 165/171, TUBE MAT HEAT EXCHANGER, Michael F. Zinn, et al., Owner of Record: *Bio-Energy Systems, Inc., Ellenville, N.Y.,* Attorney or Agent: Charles J. Brown, Ex. Gp.: 346, Requester: Charles J. Brown, Windham, N.Y.

4,270,606, Reexam. No. 90/000,692, Requested: Dec. 18, 1984, Cl. 166/181, APPARATUS FOR SELECTIVE DISENGAGEMENT OF A FLUID TRANSMISSION CONDUIT AND FOR CONTROL FLUID TRANSMISSION FROM A WELL ZONE, David M. McStravick, et al., Owner of Record: *Baker International Corp., Orange, Calif.,* Attorney or Agent: William C. Norvell, Ex. Gp.: 356, Requester: Dresser Industries, Inc., Houston, Tex.

4,396,600, Reexam. No. 90/000,687, Requested: Dec. 17, 1984, Cl. 424/88, ADULT SCHISTOSOME WORM-DERIVED ANTIGENIC SUBSTANCE AND METHOD OF OBTAINING SAME, Luigi Messineo, et al., Owner of Record: *Galluccis & Lowers, Akron, Ohio & Leesburg, Va.,* Attorney or Agent: Sherman & Shalloway, Ex. Gp.: 120, Requester: Oswaldo Cruz Foundation, Manguinhos, Brasil

4,439,475, Reexam. No. 90/000,685, Requested: Dec. 7, 1984, Cl. 428/92, NAP MAT OR CARPET OF WASHABLE TYPE HAVING INCREASED LIQUID REMOVAL THEREFROM DURING WASHING THEREOF, Aage Lang, Owner of Record: *Clean-Tex A/S, Morke, Denmark,* Attorney or Agent: E. R. Marden, Ex. Gp.: 150, Requester: Owner

4,451,996, Reexam. No. 90/000,689, Requested: Dec. 18, 1984, Cl. 36/114, ATHLETIC SHOE WITH COLLAR, Edward J. Norton, et al., Owner of Record: *New Balance Athletic Shoe, Inc., Boston, Mass.,* Attorney or Agent: S. B. Smith, Ex. Gp.: 350, Requester: Owner

Requests for Application Files

Applicants or attorneys requesting files from the Publishing Division, Office of Publications, should make their request at least twenty-four hours in advance to ensure file availability. Attention is especially directed to out-of-town requestors who visit the Office, anticipating same day service. Although the Office is usually able to respond promptly, unexpected inconvenience can be avoided if arrangements are made in advance.

Inquiries and requests should be directed to the Correspondence Section at (703) 557-6397 or (703) 557-6398 between the hours of 8:30 a.m. through 5:00 p.m. on weekdays.

Dec. 28, 1984.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name: "GERBER PRODUCTS COMPANY"

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "GERBER PRODUCTS COMPANY" used by Gerber Products Company, a corporation organized under the laws of the State of Michigan, located at 445 State St., Fremont, Mich. 49412.

The application states that the trade name is used in connection with plush toys, crib toys and other merchandise intended for use by infants and small children manufactured in Hong Kong, Taiwan, Malaysia, West Germany, Japan and Thailand.

Before final action is taken on the application, consideration will be given to any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Feb. 15, 1985.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing

and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Rm. 2417, Washington, D.C. 20229.
For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Dec. 12, 1984. *Director, Entry Procedures and Penalties Division.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Mar. 1, 1985:

WILLIAM FELDMAN,
Dec. 27, 1984. *Director, Office of Enrollment and Discipline.*

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Wurm, Mark A., 7456 Drew Ave., N., Minneapolis, Minn. 55443

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Youmatz, Vincent W., RR 1, Box 121, Suncook, N.H. 03275

Patents Available for License or Sale

D. 273,228. BUILDING STRUCTURE. *Sammy Cotton,* 1314 West 69th St., Los Angeles, Calif. 90044.

3,624,918. CLOTHES DRYERS. Correspondence to: *National Bank of Detroit,* 611 Woodward, Detroit, Mich. 48226.

4,181,763. PROCESS FOR PRODUCING SIMULATED WOODEN ARTICLES. *Robert L. Shellenberger,* Correspondence to G. Frank, 229 Gypsy La., Wynnewood, Pa. 19096.

4,239,030. FIELD BURNER APPARATUS. *Everett H. Benson* and *Ruth L. Benson,* 20568 S.E. Norse Rd., Eagle Creek, Oreg. 97022.

4,323,118. APPARATUS FOR CONTROLLING AND PREVENTING OIL BLOWOUTS. Correspondence to: *Mr. Conrad Bergmann,* Bergmann's Department Store, 1365 Lincoln Ave., San Jose, Calif. 95113.

4,420,398. FILTRATION METHOD FOR CELL PRODUCED ANTIVIRAL SUBSTANCES. *Franco Castino.* Correspondence to: Marvin R. Stern, Holman & Stern, 2401 Fifteenth St., N.W., Washington, D.C. 20009. (202)483–2234.

4,434,981. CROSS COUNTRY SKIING SIMULATING EXERCISER. *Desmond H. Norton.* Correspondence to: Mallinckrodt, Mallinckrodt, Russell and Osburn, Attention: A. Ray Osburn, 914 – 1st Security Bank Bldg., Ogden, Utah 84401.

4,477,149. RESETTABLE MIRROR ASSEMBLY. *Serge Crespy.* P.O. Box 383, Collingwood, Ontario, Canada L9Y 3Z7.

4,458,509. TREATED REVERSIBLE SKIN AND A PROCESS FOR TREATING ANIMAL SKINS TO FORM SUCH A REVERSIBLE SKIN. *Claude Pechdo,* Correspondence to: Neil F. Greenblum, Sandler & Greenblum, 701 S. 23rd St., Arlington, Va. 22202.

4,464,141. SHAFT COUPLING. *James A. Oliff,* Parkhurst & Oliff, 277 S. Washington St., Suite 212, Alexandria, Va. 22314 (703–836–6400).

4,466,593. COPYHOLDER, LECTERN, BOOK SUPPORT. *Clayton P. Odenath,* 108 Peach Rd., Bellmawr, N.J. 08031.

The following patents are offered by: Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115–0514.

4,333,423. ENGINE STEAM STRATIFIER.

4,425,892. ENGINE INTAKE STRATIFIER FOR CONTINUOUSLY VARIABLE STRATIFIED MIXTURES.

4,381,745. POROUS BURNER DIESEL ENGINE.

4,412,511. CHAR AND OIL BURNING ENGINE.

The following patents are offered by William H. Cochran, P.O. Box 32, Stonington, Conn. 06378.

3,348,992. TUFTED PRODUCTS.

3,383,259. METHOD OF MAKING A TUFTED FABRIC.

3,685,343. APPARATUS FOR DETERMINING FLAMMABILITY.

3,702,797. ANTISTATIC TEXTILE PRODUCT.

3,713,960. ANTISTATIC TUFTED PRODUCT.

3,728,204. TEXTILE PRODUCT AND PROCESS FOR MAKING SAME.

4,308,304. ANTISTATIC TUFTED PRODUCT.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, AP1–230, Louisville, Ky. 40225.

3,522,906. CARTON FLAP SUPPORT.

3,727,421. ROOM AIR-CONDITIONER ONE-PIECE CHASSIS.

3,861,283. ROOM AIR CONDITIONER MOUNTING ARRANGEMENT.

3,864,844. SOLID STATE DRYER CONTROL.

3,871,800. HERMETICALLY SEALED COMPRESSOR SUCTION TUBE ASSEMBLY.

4,006,339. MICROWAVE HEATING APPARATUS WITH MULTIPLE COUPLING ELEMENTS AND MICROWAVE POWER SOURCES.

4,006,338. MICROWAVE HEATING APPARATUS WITH IMPROVED MULTIPLE COUPLERS AND SOLID STATE POWER SOURCE.

4,031,745. METHOD OF FORMING CONSTRICTION IN TUBING.

4,059,970. AUTOMATIC ICEMAKER INCLUDING MEANS FOR MINIMIZING THE SUPERCOOLING EFFECT.

4,062,201. AUTOMATIC ICEMAKER INCLUDING MEANS FOR MINIMIZING THE SUPERCOOLING EFFECT.

4,150,679. DISHWASHER WITH IMPROVED BYPASS FILTER ARRANGEMENT.

4,158,950. HEAT PUMP DEFROST SYSTEM.

4,196,462. PROTECTIVE CONTROL CIRCUIT FOR INDUCTION MOTORS.

4,263,962. HEAT PUMP CONTROL SYSTEM.

4,283,928. TRANSMISSION FOR WASHING MACHINE.

4,285,212. ICE DISPENSER STORAGE ASSEMBLY.

4,285,214. FLEXIBLE COUPLING.

4,286,391. CONTROL SYSTEM FOR AN AUTOMATIC CLOTHES DRYER.

4,288,995. HOUSEHOLD REFRIGERATOR MOVABLE STORAGE ASSEMBLY.

4,298,110. TWO-SPEED CLUTCH WITH NEUTRAL.

4,301,666. LUBRICATION SYSTEM FOR TRANSMISSION OF AUTOMATIC CLOTHES WASHING MACHINE.

4,303,818. MICROWAVE OVEN HUMIDITY SENSING ARRANGEMENT.

4,317,343. DRIVE ARRANGEMENT WITH A WASHING MACHINE.

4,320,614. PANEL ASSEMBLY FOR SHEET METAL PANELS HAVING DOUBLE WALL CONSTRUCTION CORNERS.

4,323,342. BURNER IGNITION AND CONTROL SYSTEM.

4,325,234. ADJUSTABLE STROKE AGITATION SYSTEM.

4,330,081. WATER TEMPERATURE CONTROL SYSTEM FOR A CLOTHES WASHING MACHINE.

4,385,082. PREPARATION OF SHIELDED PLASTIC MICROWAVE OVENS.

4,386,347. METHOD OF, AND APPARATUS FOR, INCREASED RESOLUTION SLEWING OF A BAR-GRAPH-DISPLAY DATA INPUT/OUTPUT SYSTEM.

4,390,769. INDUCTION HEATING APPARATUS PROVIDING SMOOTH POWER CONTROL.

4,392,766. AUTOMATIC FEEDING APPARATUS.

4,394,564. SOLID PLATE HEATING UNIT.

4,394,565. POWER DISCONNECT ASSEMBLY FOR ELECTRIC HEATING ELEMENTS.

4,413,672. CENTRAL DESK AIR CONDITIONING CONTROL SYSTEM.

4,418,744. AIR CONDITIONING CONTROL SYSTEM WITH USER POWER UP.

4,424,439. PROTECTIVE METHOD AND CIRCUIT ARRANGEMENT FOR APPLIANCE INCORPORATING SHEATHED HEATING ELEMENT.

4,426,564. PARALLEL RESONANT INDUCTION COOKING SURFACE UNIT.

4,434,344. SELF-STORING MEAL RACK FOR A MICROWAVE OVEN.

4,435,993. CONTROL KNOB TO SHAFT ASSEMBLY.

4,437,715. RACK-SUPPORTING CHANNEL AND STOP.

4,440,004. WOBBLE WASHER.

4,441,015. COOKING APPARATUSEMPLOYING A ROTISSERIE MODE WITH STATIONARY FOOD.

4,441,545. AIR CONDITIONING THERMOSTATIC CONTROL SYSTEM HAVING MODULAR INCLUSION OF REMOTE TEMPERATURE SET-BACK CAPABILITY.

4,441,770. APPLIANCE ANTI-TIP DEVICE.

4,443,690. POWER CONTROL FOR COOKING APPLIANCE WITH TRANSIENT OPERATING MODES.

4,446,349. MICROWAVE PHASE SHIFTING DEVICE.

4,447,799. HIGH TEMPERATURE THERMISTOR AND METHOD OF ASSEMBLING THE SAME.

4,451,224. MOLD DEVICE FOR MAKING PLASTIC ARTICLES FROM RESIN.

4,453,065. MICROWAVE OVEN DOOR ALIGNING ASSEMBLY.

4,455,467. METAL RACK FOR MICROWAVE OVEN.

Applications for license may be addressed to Patent Counsel, Steam Turbine-Generator Legal Operation,

General Electric Co., 1 River Rd., Schenectady, N.Y. 12345.

4,404,486. STAR CONNECTED AIR GAP POLYPHASE ARMATURE HAVING LIMITED VOLTAGE GRADIENTS AT PHASE BOUNDARIES.

4,408,709. METHOD OF MAKING TITANIUM-STABILIZED FERRITIC STAINLESS STEEL FOR PREHEATER AND REHEATER EQUIPMENT APPLICATIONS.

4,417,476. CHARGE CONVERTER FOR VIBRATION MONITORING INSTRUMENTATION.

4,418,859. METHOD OF MAKING APPARATUS FOR THE EXCHANGE OF HEAT USING ZIRCONIUM STABILIZED FERRITIC STAINLESS STEELS.

4,430,575. TURBIN TURNING GEAR WITH HYDRAULIC OVERSPEED DRIVE.

4,451,786. HIGH SENSITIVITY BRUSH ARCING MONITOR FOR A DYNAMOELECTRIC MACHINE.

4,462,913. PROCESS FOR TREATING WASTEWATER CONTAINING FAT AND HEAVY METAL IONS.

Applications for licenses should be addressed to: Patent Counsel-SSD, General Electric Co., P.O. Box 8555, Philadelphia, Pa. 19101.

4,413,766. METHOD OF FORMING A CONDUCTOR PATTERN INCLUDING FINE CONDUCTOR RUNS ON A CERAMIC SUBSTRATE.

4,430,803. CIRCUIT FOR LEVITATED BALL INCLINOMETER.

4,437,109. SILICON-ON-SAPPHIRE BODY WITH CONDUCTIVE PATHS THERETHROUGH.

4,442,165. LOW-DENSITY THERMALLY INSULATING CARBON-CARBON SYNTACTIC FOAM COMPOSITE.

4,465,097. TURBOMACHINERY ROTOR & METHOD OF MANUFACTURE.

4,467,329. LOADED WAVEGUIDE LENSES.

Applications for license may be addressed to: General Electric Co., Component Products Group, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801–2204.

4,319,299. COMBINATION STARTER-PROTECTOR DEVICE, APPARATUS UTILIZING SUCH DEVICE, AND METHOD OF ASSEMBLING.

4,334,162. RELEASABLE COMBINATION AND METHOD OF ASSEMBLY.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 4,101,810, Jerry D. Schermerhorn, and John W. V. Miller, SYSTEM FOR AND METHOD OF OPERATING GAS DISCHARGE DISPLAY AND MEMORY, Interference No. 100,674, decided Aug. 29, 1984, claims 1–10, 19, 20, 22, 24–26 and 34–39.

Patent No. 4,128,901, John W. V. Miller, GROUND-REFERENCE POWER SUPPLY FOR GAS DISCHARGE DISPLAY/MEMORY PANEL DRIVING AND ADDRESSING CIRCUITRY, Interference No. 100,673, decided Aug. 29, 1984, claims 1, 2 and 4–7.

Patent No. 4,158,987, Joseph E. Smith, PRESSURE FOOT FOR MACHINE TOOL, Interference No. 100,786, decided June 7, 1984, claims 1, 2, 3, 4, 11, 13, 26 & 27.

Patent No. 4,264,288, Peter Wusthof, and Johann Schneider, GEROTOR MACHINE WITH FLOW CONTROL RECESSES IN THE INNER GEAR MEMBER, Interference No. 101,236, decided Oct. 30, 1984, claims 1–7.

Patent No. 4,278,345, Austin E. Davis, Raymond G. Cormier and Christopher A. Caggiula, DRUM CLEANING APPARATUS, Interference No. 101,212, decided Oct. 26, 1984, claims 1–4.

Patent No. 4,340,203, Verne P. Donner, THREE WAY SLIDE VALVE WITH CENTER RETURN, Interference No. 100,994, decided Aug. 3, 1984, claim 4.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

Status of PTO Services

The following is an update of the status of PTO services for December 1984:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	30	Due to automation problems.
Trademarks	30	30	
Patent/Trademark Copies:			
Window Coupons	5	90% within 5 days	
Mail Coupons	29	93% within 29 days*	
Letter Orders	34	93% within 34 days*	
Date of oldest unfilled order		December 18, 1984**	New reporting format see below.
Date being processed		December 28, 1984**	
Certified Copies:			
Trademark Registrations	30	20	
Status Copies (excluding title)	15	96% within 15 days	
Applications-As-Filed	20	97% within 7 days	
File-Wrapper/Contents	N/A	95% within 7 days	
Walk-up Certification	1	97% within 24 hours	
Trademark Search Library:			
Filing Drawings	21	32	
Filing Reg. Certificates	3	8	
Assignments:			
Patents	25	22	
Trademarks	25	15	
Avg. Days from Issue Fee Payment to Issue Date	90–100	88	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 9 days late	Delay due to new printing contractor.
Patent Copies Available	Issue Date	94% on issue date	Delay due to new printing contractor.
Trademark Copies Available	Issue Date	99% on issue date	
Trademark Official Gazette:			
In Bookstore	Issue Date	Issue Date	
Mailed	Issue Date	Issue Date	
Trademark Regs. Mailed	Issue Date	Issue Date	

*Figures include postal processing and delivery time.
**Dates are day of receipt for (1) the single oldest order and (2) the majority of orders in process.

IMPROVEMENTS TO SERVICE

- *Manual of Patent Examining Procedure on CASSIS* — The Classification and Search Support Information System (CASSIS) has been enhanced to make your search for patent and classification information easier and more effective. This is the fourth revision and includes access commands to allow viewing of the Manual of Patent Examining Procedure (MPEP). A new users guide (Oct. 1984) is available in the Public Search Room.
- *More Informative Service Statistics* — Under Patent/Trademark copies, we had previously been reporting the "Date of oldest unfilled order", which was in fact our oldest order currently being processed. This could be misleading and we have now decided to also report "Date being processed". With these two dates one can now be aware of our current processing date, as well as the date of the oldest order awaiting to be completed.

HELPFUL HINTS FROM THE PTO

- *Requests for Application Files* — Applicants or attorneys requesting files from the Publishing Division, Office of Publications, should make their request at least twenty-four hours in advance to ensure file availability. Attention is especially directed to out-of-town requesters who visit the Office, anticipating same day service. Although the Office is usually able to respond promptly, unexpected inconvenience can be avoided if arrangements are made in advance. Inquiries and requests should be directed to the Correspondence Section at (703) 557–6398 between the hours of 8:30 a.m. through 5:00 p.m. on weekdays.

FIRST MAINTENANCE FEES RECEIVED

- The Patent and Trademark Office has received the first payments from a patentee under provisions of a law passed by Congress in 1980 and amended in 1982 providing for patent maintenance fees. The first payments were made by American Home Products Corp. of N.Y.

Jan. 7, 1985.

THERESA A. BRELSFORD
Assistant Commissioner for Administration.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Part 1

[Docket No. 40104-4151]

Patent Interference Proceedings

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: The Patent and Trademark Office is amending its rules of practice in patent interference cases. The Patent Law Amendments Act of 1984, Pub. L. 98-622, sections 201-202, abolished the Board of Appeals and Board of Patent Interferences and created in their place a Board of Patent Appeals and Interferences which will decide *ex parte* appeals from adverse decisions of patent examiners and interference cases. The Patent and Trademark Office, through this amendment of its rules, intends to provide guidance on the procedures the Office will be following in conducting interference cases before the Board of Patent Appeals and Interferences.

DATE: The effective date of these rules is: February 11, 1985.

FOR FURTHER INFORMATION CONTACT: Fred E. McKelvey by telephone at (703) 557-4025 (if no answer, message may be left at 703-557-4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The Patent and Trademark Office (PTO) conducts interference proceedings to determine who as between two or more applicants for patent or one or more applicants and one or more patentees is the first inventor of a patentable invention. Heretofore, the determination was made by a Board of Patent Interferences. The Patent Law Amendments Act of 1984, Pub. L. 98-622, sections 201-202 combines the Board of Appeals and the Board of Patent Interferences into a single Board of Patent Appeals and Interferences (Board) and authorizes the Board to consider priority and patentability in interference cases.

In view of the discretion given the Board under 35 U.S.C. 135(a), as amended by Pub. L. 98-622 ("The Board . . . may determine questions of patentability. . . ."), these new rules will apply to all interferences declared on or after February 11, 1985, except in special circumstances, such as: (1) Interferences which are declared as a result of a motion made in another interference which was pending before the Board before February 11, 1985 (e.g., an interference declared as a result of a motion under 37 CFR 1.231 to declare an additional interference); (2) an interference related to another interference declared prior to February 11, 1985 (e.g., an interference involving a method of using a compound where an interference involving the same parties and the compound was declared prior to February 11, 1985); and (3) an interference reinstituted after having been dissolved under the old rules (37 CFR 1.201-1.288) (e.g., an interference reinstituted after having been dissolved as a result of a motion under 37 CFR 1.231 to dissolve on the grounds of unpatentability where the applicant has obtained allowance of the claims held unpatentable in the decision on motions).

Through these new rules the PTO seeks to improve interference procedure so that the rights of parties in interferences are determined at an early date and the overall process of examining patent applications which become involved in interferences is simplified.

In order to obtain maximum input from the public prior to formally proposing revisions to the rules, on August 1, 1983, the PTO published in the **Federal Register** an advance notice of proposed rulemaking for interference rules. 48 FR 34836-34855. The advance notice was not published in the *Official Gazette*. Twenty-one written comments were received. All comments are available for public inspection in Room 10C01, Crystal Gateway II, 1225 Jefferson Davis Highway, Arlington, Virginia.

On January 30, 1984, the PTO published in the **Federal Register** a notice of proposed rulemaking. 49 FR 3768-3802. The notice was also published in the *Official Gazette* on February 14, 1984. 1039 O.G. 11; 1039 TMOG 11. The notice also appeared in the Bureau of National Affairs' Patent, Trademark & Copyright Journal, Vol. 27, pp. 312-346 (February 2, 1984), hereinafter "BNA." Eighteen written comments were received in response to the notice of proposed rulemaking. The comments are analyzed herein. A hearing was held on May 15, 1984. Three individuals appeared at the hearing. Oral comments made at the hearing are also analyzed herein. The eighteen comments and copy of the transcript of the hearing are available for public inspection in Room 10C01, Crystal Gateway II, 1225 Jefferson Davis Highway, Arlington, Virginia.

The new rules for interferences are set forth herein in §§ 1.601 through 1.688. The new rules replace entirely the present interference rules (37 CFR 1.201 through 1.288). A "six hundred" number series is used for the new rules. The use of a six hundred number series for the new rules will permit interested individuals to research published decisions (e.g., F.2d, USPQ) or computerized legal research services (e.g., LEXIS) citing the new rules.

An index of the headings of §§ 1.601-1.688 and a table correlating 37 CFR 1.201 through 1.288 (old rules) to §§ 1.601 through 1.688 (new rules) appears below.

Under the new rules, interferences are decided by the Board. The Board has jurisdiction to determine (1) priority of invention, (2) patentability of any claim corresponding to a count both as to applicants and patentees, (3) any issue of interference-in-fact as to any count, and (4) any other issue necessary to resolve the interference. The rules permit an interference to be declared on the basis of a single count defining one patentable invention in interferences involving patents as well as applications. The Board also has jurisdiction to determine whether counts are patentably distinct.

When an interference is declared, an examiner-in-chief is assigned to handle the interlocutory stages of the interference. An examiner having full signatory authority determines when one or more applications and a patent claim the same patentable invention. When the examiner makes such determination, the examiner will forward any involved applications or patents to the Board. The examiner will designate, at the time the involved applications or patents are sent to the Board, the claims of any application and patent which correspond to each count. The examiner-in-chief can subsequently designate additional claims to correspond to a count. The examiner-in-chief assigned to handle the interference will issue a notice to the parties declaring the interference.

The object of the interference will be to resolve all controversies as to all interfering subject matter defined by one or more counts. A final decision in the interference will determine who, if anyone, is entitled to claims which correspond to a count. Any decision adverse to an applicant by the Board will constitute a final refusal by the PTO to that applicant of the claims involved. Any decision adverse to a patentee constitutes cancellation from the patent of the claims involved.

Any decision by the Board on any issue is binding on the examiner and would govern further proceedings in the PTO.

The designation of a single examiner-in-chief to handle the interlocutory phases of an interference will permit better management of, and control over, interference proceedings. The rules provide that times be set and the examiner-in-chief exercise control over proceedings in the interference such that pendency of the interference before the Board from declaration to final decision will not normally exceed 24 months. The examiner-in-chief should be familiar with the history of the interference and will be accessible to counsel for the parties. For example, an examiner-in-chief, where appropriate, may conduct telephone conference calls to obtain agreement of the parties on the setting of schedules. The rules also permit the examiner-in-chief to hold hearings in the PTO or by conference telephone call in order to expedite or settle interlocutory issues in interferences. Any hearing can be transcribed by a court reporter under such conditions as an examiner-in-chief or the Board deems appropriate. The examiner-in-chief, where appropriate, will be available by phone to rule on the admissibility of evidence in the event parties encounter unusual problems during the taking of depositions. The examiner-in-chief will also be available to rule on requests for production of documents which take place during cross-examination. Oral orders given by phone will be followed by written orders.

At the time an interference is declared, the examiner-in-chief will set a time for filing preliminary motions. The preliminary motions can include:

(1) A motion for judgment on the ground that a claim corresponding to the count is not patentable to an opponent under 35 U.S.C. 102, 103, 112, or any other provision of law.

(2) A motion for judgment on the ground that there is no interference-in-fact between the claims of the opponents in the interference.

(3) A motion to add or to substitute new counts, to amend a claim corresponding to a count, to designate an application or patent claim to correspond to a count, to designate an application or patent claim as not corresponding to a count, or to require an applicant to present a claim to be designated to correspond to a count.

(4) A motion to substitute another application for the application involved in the interference or to add an application for reissue to the interference.

(5) A motion to declare another interference.

(6) A motion to be accorded the benefit of an earlier application or to attack the benefit of an earlier application which has been accorded to an opponent.

Other motions are permitted as necessary, such as a motion to amend the count and/or a claim corresponding to the count in response to a preliminary motion for judgment.

Oppositions to motions are permitted if filed within a time set by the examiner-in-chief. Replies are also authorized. Papers which are not authorized by the rules or requested by the examiner-in-chief can be returned unfiled.

A preliminary statement will be filed prior to or concurrently with the preliminary motions outlined above.

Motions will be decided by an examiner-in-chief, who may consult with an examiner on questions of patentability which have not previously been decided by the examiner. The examiner-in-chief may grant a motion, deny a motion, defer consideration on the merits of a motion to final hearing, or take such other action with respect to a motion as may be appropriate, e.g., dismiss an entirely inappropriate motion.

At the time preliminary motions are decided, the preliminary statements will be opened. If a decision on a motion or inspection of the preliminary statement results in entry of an order to show cause why a judgment should not be entered, the party against whom judgment might be entered can request a hearing before the examiner-in-chief and two additional examiners-in-chief. The decision will govern further proceedings. If adverse, the decision will constitute a final agency action. If favorable, the interference will proceed before the examiner-in-chief.

After preliminary motions are decided and assuming judgment does not result, a period may be set for the parties to file motions for additional discovery. The scope of the additional discovery would be the same as under current practice.

When a time period is set for filing discovery motions, or after discovery has closed, the examiner-in-chief will set a period for taking testimony. Any party wishing to take the testimony of a witness can elect to have the testimony of the witness taken by deposition or presented by affidavit. A transcript of an *ex parte* deposition can be used as an affidavit. If an affidavit is presented, the opposing party may then cross-examine on oral deposition. Any redirect will take place at the deposition. The party calling the witness is responsible for securing a court reporter and filing the transcript and record associated with cross-examination of its witness.

In the event a party needs testimony from a third-party who will not appear unless a subpoena is issued, including a hostile witness, direct and cross-examination testimony may be taken on oral deposition. The rules provide that prior authorization of an examiner-in-chief is required before a party can take testimony by issuance of a subpoena under 35 U.S.C. 24. The rule thus adopts the policy of *Sheehan* v. *Doyle*, 513 F.2d 895, 898, 185 USPQ 489, 492 (1st Cir.), *cert. denied*, 423 U.S. 874 (1975), and *Sheehan* v. *Doyle*, 529 F.2d 38, 40, 188 USPQ 545, 546 (1st Cir.), *cert. denied*, 429 U.S. 870 (1976), *rehearing denied*, 429 U.S. 987 (1976), and rejects the policy announced in *Brown* v. *Braddick*, 595 F.2d 961, 967, 203 USPQ 95, 101–102 (5th Cir. 1979). Testimony obtained in other proceedings, e.g., another interference or an infringement action, may be used if otherwise admissible.

Under the rules, the Federal Rules of Evidence are made applicable to interferences, except for those portions which relate to criminal actions, juries, and other matters not relevant to interferences. Those portions include:

(1) Rule 103(c).

(2) Rule 104 (c), (d), and (e).

(3) The language in Rule 105 which reads "and instruct the jury accordingly."

(4) Rule 201(g).

(5) The language in Rule 403 which reads "or misleading the jury."

(6) Rule 404(a) (1) and (2).

(7) The word "charge" in Rule 405(b).

(8) The language "or criminal" and proviso (ii) in Rule 410.

(9) Rule 412.

(10) Rule 606.

(11) The language "whether by an accused" and "other" in the last sentence of Rule 607.

(12) The provisions of the first sentence of Rule 611(c) relating to leading questions on direct examination do not apply to statements made in an affidavit authorized to be filed under the rules.

(13) The language "Except as otherwise provided in criminal proceedings by section 3500 of title 18, United States Code" and "except that in criminal cases when the prosecution elects not to comply, the order shall be one striking the testimony or, if the court in its discretion determines that the interests of justice so require, declaring a mistrial" in Rule 612.

(14) Rule 614.

(15) Rule 706.

(16) The language "excluding, however, in criminal cases matters observed by police officers and other law enforcement personnel" and "and against the Government in criminal cases" in Rule 803(8).

(17) The language "but not including, when offered by the Government in a criminal prosecution for purposes other than impeachment, judgments against persons other than the second" in Rule 803(22).

(18) The language "prosecution for homicide or in a" in Rule 804(b)(2).

(19) The language "A statement tending to expose the declarant to criminal liability and offered to exculpate the accused is not admissible unless corroborating circumstances clearly indicate the trustworthiness of the statement" in Rule 804(b)(3),

(20) Rule 1101(a), (b), (d)(2), (d)(3), and (e).

The examiner-in-chief will set a period for filing the record and briefs. Oral hearings normally will be held before a panel consisting of the examiner-in-chief assigned to the interference and two other examiners-in-chief. The panel will render a final decision in the interference. Requests for reconsideration are permitted.

In rendering its decision, the Board will consider only that evidence which can be made available to the public under § 1.11(a). Accordingly, the Board will not consider evidence which is submitted under a protective order issued by a court if release of that evidence under § 1.11(a) would be inconsistent with the terms of the court's order.

A final decision of the Board is reviewable in the U.S. Court of Appeals for the Federal Circuit or an appropriate U.S. district court. Any reviewing court can review all aspects of the decision including patentability, priority, and all relevant interlocutory orders, such as denials of discovery.

Except as noted above, these new rules are applicable to all interferences declared on or after February 11, 1985. Interferences declared prior to February 11, 1985, continue to be governed by the prior rules (37 CFR 1.201–1.288 (July 1, 1984)) and will be decided by personnel of the Board of Patent Appeals and Interferences. Actions presently taken by a patent interference examiner or examiners of interferences will be taken by an examiner-in-chief.

An anticipated time schedule for a two-party interference follows.

Sections 1.601 through 1.688 would introduce new concepts in interference practice. Some of the more significant aspects of the rules, as well as some of the new concepts, include the following.

Section 1.1 codifies a practice announced in a Commissioner's Notice of November 28, 1983, "Mailing of Papers to the PTO in Patent Interference Proceedings," 1037 *Official Gazette* 25 (December 27, 1983) and authorizes a party in an interference to direct mail to the PTO intended for the interference to a special box in the Mail Room for interference papers. Amendments copying claims which are filed prior to the time an interference is declared would continue to be addressed in accordance with § 1.5(a).

Section 1.5 provides that when a paper filed in the PTO concerns an interference which has been declared, it should state the names of the parties (e.g., Smith v. Jones) and the number of the interference. The name of the examiner-in-chief assigned to the interference (§ 1.610) and the name of the party filing the paper should also appear conspicuously on the first page of the paper. Identification of the examiner-in-chief assigned to the interference and the name of the party filing the paper will greatly assist the Board in its administration of interference cases.

Section 1.8 excludes from the certificate of mailing practice any paper in an interference which an examiner-in-chief orders filed by hand or "Express Mail." Papers filed by "Express Mail" in an interference case would be addressed as set forth in § 1.1(e).

Section 1.11 sets forth when the interference file would become available to the public without a petition for access.

Section 1.48 provides that when a request is filed to correct inventorship of an application involved in an interference, the request shall comply with the requirements of § 1.48 and shall be accompanied by a motion under § 1.634. The request will be placed in the file of the application and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.138 permits an attorney or agent to sign and file a paper abandoning an application involved in an interference.

Section 1.196 more clearly sets forth the options open to an applicant when the Board makes a new ground of rejection under § 1.196(b). The last sentence of paragraph (b)(1) is intended to clarify practice in certain situations. One situation involves a case where (1) the Board affirms an examiner's rejection of a "first" claim and makes a new ground of rejection under § 1.196(b) of a "second" claim, (2) the applicant elects to have further proceedings before the examiner on the new ground of rejection on the second claim, and (3) those proceedings do not result in a further appeal (i.e., the second claim is allowed or is cancelled). The last sentence of § 1.196(b)(1) permits the Board to make its decision final on the first claim. By making its decision final on the first claim, the time period under § 1.304 for seeking judicial review begins. Another situation involves a case where (1) the Board affirms an examiner's rejection of a claim over reference A, (2) the Board also enters a new ground of rejection of the claim over reference B, (3) the applicant elects to have further proceedings before the examiner on the new ground of rejection, and (4) those proceedings result in applicant overcoming the new ground of rejection based on reference B. The last sentence of § 1.196(b)(1) permits the Board to make its decision final as to its affirmance of the rejection over reference A. Entry of an order making its decision final would start the period under § 1.304 for seeking judicial review. Thus, an applicant does not forego possible judicial review by electing further prosecution before the examiner when a new ground of rejection is made by the Board. Under paragraph (d), a recommendation by the Board that an allowed claim be rejected is binding on the examiner (rather than being a mere recommendation as was previously the case) in the absence of (1) an amendment, (2) showing of facts by affidavit or other appropriate evidence, or (3) both. The last sentence of paragraph (d) is intended to clarify that the Board may enter a final decision in certain circumstances. When the Board affirms an examiner's rejection of a "first" claim and makes a recommendation under paragraph (d) as to a "second" claim, the application is remanded to the examiner and the Board's decision affirming the rejection of the first claim is not a final decision. If proceedings before the examiner on remand do not result in a further appeal (i.e., the second claim is allowed or is cancelled), the Board may then make its decision final as to the first claim. By making its decision final as to the first claim, the time period under § 1.304 for seeking judicial review starts. Thus, an applicant does not forego judicial review on the first claim merely because of the remand proceedings with respect to the second claim.

Most of the current interference rules (§§1.201 through 1.247 and 1.251 through 1.288) are removed, but will continue to govern interferences declared prior to February 11, 1985. Section 1.248 is retained and governs service of papers in all patent cases except interference proceedings. Section 1.646 governs service of papers in interference proceedings.

Under § 1.292, it is intended to modify public use proceedings only to the extent that public use and on sale issues

which arise during an interference shall be raised by a preliminary motion under §1.633(a). There is no fee for filing the motion in the interference, but a fee would continue to be necessary when a petition is filed for institution of a public use proceeding apart from an interference. When a public use proceeding is instituted apart from an interference, the Commissioner will designate an appropriate official to conduct the proceeding including the setting of times for taking testimony under §§1.671 through 1.685. There will continue to be no "additional discovery" (see §§1.687 and 1.688) in public use proceedings.

Section 1.304 makes clear that the provisions of § 1.136 do not apply when judicial review is sought of a decision of the Board of Patent Appeals and Interferences in (1) a reexamination proceeding or (2) an interference. An extension of time to seek judicial review of a decision of the Board in a reexamination proceeding may be obtained under § 1.550(c). An extension of time to seek judicial review of a decision of the Board of an interference proceeding may be obtained under § 1.645. Section 1.304 also establishes an "excusable neglect" standard for seeking judicial review in interference cases when a notice of appeal is untimely filed or a civil action is not timely commenced. The excusable neglect standard is intended to be the same as the standard under Rule 4(a)(5) of the Federal Rule of Appellate Procedure.

Section 1.322 provide that when a request for a certificate of correction under 35 U.S.C. 254 (PTO mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of § 1.322 and shall be accompanied by a motion under § 1.635. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.323 provides that when a request for a certificate of correction under 35 U.S.C. 255 (patentee's mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of § 1.323 and shall be accompanied by a motion under §1.635. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.324 provides that when a request is filed to correct inventorship of a patent involved in an interference, the request shall comply with the requirements of § 1.324 and shall be accompanied by a motion under proposed § 1.634. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.565 provides that when a patent is involved in an interference proceeding and a reexamination proceeding, both the interference proceeding and the reexamination proceeding *will* continue unless one of the proceedings is stayed. A stay of a reexamination proceeding will be made by the Commissioner. A stay of an interference proceeding will be made by an examiner-in-chief, subject to review by the Commissioner. Section 1.565 continues the present practice of the Commissioner determining in every instance whether to stay a reexamination proceeding when the patent involved in the reexamination proceeding is sought to be reissued or becomes involved in litigation.

Under § 1.601, the rules shall be construed to secure the just, speedy, and inexpensive determination of interferences. Section 1.601 defined various terms used in Subpart E including "additional discovery," "affidavit," "case-in-chief," "case-in-rebuttal," "count," "effective filing date," "filing date," "interference," "interference-in-fact," "junior party," "lead" attorney, "party," "phantom count," "same patentable invention," "separate patentable invention," "senior party," "sworn," and "United States." "Affidavits" include declarations under 35 U.S.C. 25 and 37 CFR 1.68 as well as statutory declarations under 28 U.S.C. 1746. The definition of "United States" is the same as the definition of United States isn 35 U.S.C 100(c).

The definition of "interference" permits an interference between one or more applications and one of more patents. Thus, these new rules follow the policy of *Wilson* v. *Yakel*, 1876 Dec. Comm'r. Pat. 245 (Comm'r. Pat. 1876) and, to the extent inconsistent therewith, do not follow the policy announced in *Touval* v. *Newcombe*, 194 USPQ 509 (Comm'r. Pat. 1976). However, in view of the statutory requirement for the presence of at least one application in an interference, if an applicant were to concede priority or otherwise be terminated from an interference involving only one application and more than one patent, the interference would have to be terminated for lack of subject matter jurisdiction unless one or more of the patentees filed an application for reissue which could be added to the interference under § 1.633(h). A "count" defines interfering subject matter. An interference may have two counts only if the second count defines a "separate patentable invention" from the first count. The reason the second count must define a separate patentable invention is to permit the PTO to lawfully issue separate patents to different parties in an interference when a single party does not prevail as to all counts. A "separate patentable invention" is defined in § 1.601 (n):

> Invention (A) is a "separate patentable invention" with respect to invention (B) when invention (A) is new (35 U.S.C. 102) and non-obvious (35 U.S.C. 103) in view of invention (B) assuming invention (B) is prior art with respect to invention (A).

Section 1.602(a) continues the present PTO practice (37 CFR 1.201(c)) of not declaring or continuing an interference between (1) two or more applications owned by the same party or (2) an application and a patent owned by a single party unless good cause is shown. A corporation and its wholly-owned subsidiary are considered a "single party" within the meaning of § 1.602(a). Under prior rules, when a patent and an application involved in an interference became commonly owned, the interference was not "dissolved." Rather, the PTO required that the interference be terminated with a judgment. *Chillas* v. *Weisberg*, 1928 Dec. Comm'r. Pat. 24 (Comm'r. Pat. 1928); *Malone* v. *Toth*, 202 USPQ 397 (Comm'r. Pat. 1978); and *Morehouse* v. *Armbruster*, 209 USPQ 514 (Comm'r. Pat. 1980). Under these new rules, all interferences, including those involving only applications, will be terminated with a judgment. As noted in *Chillas* v. *Weisberg*, *supra* at 25 "the common owner can allow a judgment against the junior party to be rendered by default or it can file a concession of priority from one party to the other." Paragraphs (b) and (c) of § 1.602 continue the present PTO practice (37 CFR 1.201(c)) of requiring a party to notify the PTO of any real party in interest not apparent on the face of the notice declaring the interference (see § 1.611) or of any change in the real party in interest after the interference is declared. The PTO needs to know the identity of any real party in interest to properly enforce § 1.602(a) and to enable an examiner-in-chief to determine whether recusal is necessary or appropriate. A new requirement in paragraphs (b) and (c), not present in 37 CFR 1.201(c), is a 20-day time period for advising the PTO of the identity of, or any change in, the real party in interest.

Under §§ 1.601(f), 1.603, and 1.606, the interfering subject matter would be defined by one or more counts. All the claims in an application or a patent

which define the same patentable invention as a count would be designated to correspond to the count. An interference would have two counts only if one count defines a separate patentable invention from another count. Under § 1.606, at the time an interference is declared between a patent and an application, a count would not be narrower in scope than any patent claim which corresponds to the count. Thus, a patent claim would be presumed, subject to a motion under § 1.633(c), not to embrace "separate patentable inventions." Some examples illustrate how the PTO would formulate counts and designate patent and application claims to correspond to counts.

Example 1: Application A contains patentable claim 1 (engine). Application B contains patentable claim 8 (engine). If an interference is declared, there would be one count (engine). Claim 1 of application A and claim 8 of application B would be designated to correspond to the count.

Example 2: Application C contains patentable claims 1 (engine) and 2 (6-cylinder engine). Application D contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application C and claim 8 of application D would be designated to correspond to the count.

Example 3: Application E contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application F contains patentable claims 11 (engine) and 12 (8-cylinder engine). Claims 1 and 2 of application E and claims 11 and 12 of application F define the same patentable invention. Claim 3 of application E defines a separate patentable invention from claims 1 and 2 of application E and claims 11 and 12 of application F. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application E and claims 11 and 12 of application F would be designated to correspond to the count. Claim 3 of application E would not be designated to correspond to the count.

Example 4: Application G contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application H contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H define the same patentable invention. Claim 3 of application G and claim 15 of application H define a separate patentable invention from claims 1 and 2 of application G and claim 11 of application H. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H would be designated to correspond to Count 1. Claim 3 of application G and claim 15 of application H would be designated to correspond to Count 2.

Example 5: Application J contains patentable claims 1 (engine), 2 (combination of an engine and a carburetor) and 3 (combination of an engine, a carburetor, and a catalytic converter). Application K contains patentiable claims 31 (engine), 32 (combination of an engine and a carburetor), and 33 (combination of an engine, a carburetor, and an air filter). The engine, combination of an engine and carburetor, and combination of an engine, carburetor, and air filter define the same patentable invention. The combination of an engine, carburetor, and catalytic converter define a separate patentable invention from engine. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application J and claims 31, 32, and 33 of application K would be designated to correspond to the count. Claim 3 of application J would not be designated as corresponding to the count.

Example 6: The PTO will continue to follow *Waldeck* v. *Lewis*, 120 USPQ 88 (Comm'r.Pat. 1955). Application L contains patentable claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application M contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of application L and claim 11 of application M would be designated to correspond to the count.

Example 7: Application N contains patentable claim 1 (benzene). Application P contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of application N and claim 11 of application P would be designated to correspond to the count.

Example 8: Application Q contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application R contains patentable claim 33 (benzene). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application Q and claim 33 of application R would be designated to correspond to the count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be one count (benzene). Claims 1 and 2 of application Q and claim 33 of application R would be designated to correspond to the count. Claim 3 of application Q would not be designated to correspond to the count.

Example 9: Application S contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application T contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application S and claims 11, 12, and 13 of application T would be designated to correspond to the count. The PTO will continue to adhere to *Becker* v. *Patrick*, 47 USPQ 314 (Comm'r.Pat. 1939). An interference can have two counts only if one count defines a separate patentable invention from another count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be two counts: Count 1 (benzene) and Count 2 (chloroform). Claims 1 and 2 of application S and claims 11 and 12 of application T would be designated to correspond to Count 1. Claims 1 and 3 of application S and claims 11 and 13 of application T would be designated to correspond to Count 2.

Example 10: Patent A contains claim 1 (engine). Application U contains patentable claim 11 (engine). If an interference is declared, there would be one count (engine). Claim 1 of patent A and claim 11 of application U would be designated to correspond to the count.

Example 11: Patent B contains claims 1 (engine) and 2 (6-cylinder engine). Application V contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent B and claim 8 of application V would be designated to correspond to the count.

Example 12: Patent C contains claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application W contains patentable claims 11 (engine) and 12 (8-cylinder engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W define

the same patentable invention. Claim 3 of patent C defines a separate patentable invention from claims 1 and 2 of patent C and claims 11 and 12 of application W. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W would be designated to correspond to the count. Claim 3 of patent C would not be designated to correspond to the count.

Example 13: Patent D contains claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application X contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X define the same patentable invention. Claim 3 of patent D and claim 15 of application X define a separate patentable invention from claims 1 and 2 of patent D and claim 11 of application X. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X would be designated to correspond to Count 1. Claim 3 of patent D and claim 15 of application X would be designated to correspond to Count 2.

Example 14: Patent E contains claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application Y contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of patent E and claim 11 of application Y would be designated to correspond to the count.

Example 15: In this example, the claims of patent E and application Y in Example 14 are reversed. Patent E contains claim 1 (benzene). Application Y contains patentable claims 11 (Markush group of benzene or toluene), 12 (benzene), and 13 (toluene). If an interference is declared, the count would be the same as the count in Example 14—(Markush group of benzene or toluene). Claim 1 of patent E and claims 11, 12, and 13 of application Y would be designated to correspond to the count.

Example 16: The PTO will continue to follow cases such as *Case* v. *CPC International, Inc.*, 730 F.2d 745, 221 USPQ 196 (Fed. Cir. 1984); *cert. denied*, 105 S.Ct. 233 (1984); *Aelony* v. *Arni*, 547 F.2d 566, 192 USPQ 486 (CCPA 1977); and *Nitz* v. *Ehrenriech*, 537 F.2d 539, 190 USPQ 413 (CCPA 1976), and declare interferences where interfering patent and application claims are mutually exclusive provided the claims define the same patentable invention. Patent F contains claim 1 (benzene). Application Z contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of patent F and claim 11 of application Z would be designated to correspond to the count.

Example 17: It will be the practice of the PTO under § 1.606 to initially declare interferences with counts which are identical to or broader than patent claims which correspond to the counts. A single patent claim would be presumed, subject to a motion under § 1.633(c), not to define separate patentable inventions. Patent G contains claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application AA contains patentable claim 33 (benzene). If an interference is declared, initially it would be presumed by the PTO, subject to a later motion under § 1.633(c), that benzene and chloroform define the same patentable invention. There would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent G and claim 33 of application AA would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, that party could file a motion under § 1.633(c) to redefine the count and the claims corresponding to the counts.

Example 18: Patent H contains claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application AB contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). Benzene and chloroform initially would be presumed, subject to a motion under § 1.633(c), to define the same patentable invention, because they are recited as a Markush group in a single patent claim. If an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent H and claims 11, 12, and 13 of application AB would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, the party could move under § 1.633(c) to substitute a count (benzene) for (Markush group of benzene or chloroform) and to add a count (chloroform). See Example 36.

Example 19: Under § 1.606, the PTO will continue to follow the practice announced in *Ex parte Card and Card*, 1904 Dec.Comm'r.Pat. 383 (Comm'r.Pat. 1904). Patent J contains claim 1 (method of mixing, grinding, and heating). Application AC contains patentable claim 8 (method of mixing and heating) and does not disclose or claim a grinding step. In the context of the inventions disclosed in patent J and application AC, a method of mixing, grinding, and heating is the same patentable invention as a method of mixing and heating. Under current practice, it would be said that "grinding" is an "immaterial" limitation in claim 1 of patent J. Under § 1.606, the fact application AC does not disclose grinding would not preclude an interference. If an interference is declared, there would be one count (method of mixing and heating). Claim 1 of patent J and claim 8 of application AC would be designated to correspond to the count.

Under § 1.605, timely filing of an amendment presenting a claim suggested by the examiner for purposes of an interference would stay *ex parte* proceedings in the application in which the claim is presented pending a determination by the examiner of whether an interference will be declared. Also under § 1.605(a), when an examiner suggests a claim, the applicant will be required to copy verbatim the suggested claim. At the time the suggested claim is copied, however, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the copied claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

Under § 1.607(b), when an applicant seeks an interference with a patent, e.g., by copying claims from the patent, examination of the application including any appeal would be handled with special dispatch within the PTO. "Special dispatch" would be construed to be the same as special dispatch in a reexamination proceeding. See 35 U.S.C. 305.

Under § 1.608, the PTO will continue current practice (37 CFR 1.204(c)) of requiring an applicant seeking to provoke an interference with a patent to submit evidence which demonstrates that the applicant is *prima facie* entitled to a judgment relative to the patentee. Evidence would be submitted only when the earlier of the filing date or effective filing date of the application is more than three months after the earlier of the filing date or effective filing date under 35 U.S.C. 120 of the patent. The evidence may relate to patentability and need not be restricted to priority. When the evidence (1) consists of prior printed publications and patents and (2) shows that the claims of the application are not

patentable, the claims in the application would be rejected and the applicant could file a request for reexamination of the patent.

Section 1.609 sets forth what an examiner shall forward to the Board when an interference is declared. For the most part, § 1.609 continues current practice. However, under § 1.609(b)(3), the examiner would identify all claims in an application which the examiner believes are patentable over the proposed counts. Thus, a claim in an application would either correspond to a count or would be indicated as being patentable over the count. For instance, in Example 3, *supra*, the examiner would indicate that (1) claims 1 and 2 of application E and claims 11 and 12 of application F correspond to the count and (2) claim 3 of application E defines a separate patentable invention from the count.

Under § 1.610, each interference will be declared by an examiner-in-chief. The examiner-in-chief enters all interlocutory orders in the interference. As necessary, another examiner-in-chief may act in place of the examiner-in-chief assigned to the interference. At the discretion of the examiner-in-chief assigned to the interference, a panel of two or more examiners-in-chief may enter an interlocutory order. The examiner-in-chief will set times and control proceedings such that pendency of the interference normally will not exceed 24 months. Under § 1.610(d), the examiner-in-chief is authorized to hold conferences. Any conference can be by a telephone conference call. Under § 1.610(e), an examiner-in-chief is authorized to determine a proper course of conduct for any situation not specifically covered by the rules.

Under § 1.611(a), the PTO will normally notify each party at its correspondence address (37 CFR 1.33(a)) that an interference is declared. This practice will save the PTO the administrative burden of sending multiple notices as is required by the present rules. Under § 1.611(a), the PTO could, in an appropriate circumstance, also send a notice to a patentee or an assignee. An appropriate circumstance for sending an additional notice would be a situation where a patent was issued on the basis of an application filed under 37 CFR 1.47. The matters to be specified in a notice declaring an interference are set out in § 1.611(c). One item to be set out is the "order of the parties," meaning the order in which the parties will take testimony. If Jones is the junior party and Smith is the senior party, the order of the parties is: Jones v. Smith. The order of the parties may change as a result of the granting of a motion under § 1.633 (d), (f), or (g). Under § 1.611(d), the notice declaring the interference may also set dates for filing preliminary statements, notices that preliminary statements have been filed, motions under § 1.633, oppositions to those motions, and replies to the oppositions. Alternatively, an examiner-in-chief may set those times in a separate order before or after consultation with counsel for the parties. Under § 1.611(e), the PTO may place a notice in the *Official Gazette* each time an interference is declared involving a patent. The notice would make it easier for patent practitioners throughout the country to determine whether a given patent is or has been involved in an interference.

Under § 1.612, except for affidavits under § 1.131 and any evidence and explanation under § 1.608(b) filed separate from an amendment, each party shall have access to the file of every other party after an interference is declared. The files of applications and patents involved in an interference will be maintained in the Service Branch of the Board of Patent Appeals and Interferences for inspection and copying. Any explanation which is filed as part of an amendment or an amendment which discusses details contained in an affidavit under § 1.131 would not be sealed under § 1.612(a). Thus, § 1.612(a) continues the practice discussed in *Moorman* v. *Martin*, 103 USPQ 273 (Comm'r.Pat. 1950) and Calvert, *An Overview of Interference Practice*, 62 J. Pat. Off. Soc'y. 290, 293 (1980). Under § 1.612(b), each party will have access to an opponent's affidavit under § 1.131 or an opponent's evidence and explanation under § 1.608(b) when a decision is rendered on motions under § 1.633. Under § 1.612(c), a party would be required to serve any evidence and explanation under § 1.608(b) if an order to show cause is issued under § 1.617(a) and the party responds to the order under § 1.617(b). Under § 1.612(d), the parties may agree to exchange copies of their respective files.

Under § 1.613(a), when a party has appointed more than one attorney or agent of record, the party may be required to designate a "lead" attorney or agent. A lead attorney or agent would be a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the individual whom an examiner-in-chief can contact to set times and take other action in the interference. Section 1.613(b) continues the practice of not permitting the same attorney or agent to represent two or more parties in an interference except as permitted by Chapter 1, see e.g., § 1.344. Under § 1.613(c), an examiner-in-chief can make an appropriate inquiry to determine whether an attorney or agent should be disqualified from representing a party. A final decision to disqualify an attorney or agent is made by the Commissioner under 35 U.S.C. 32.

Section 1.614 specifies when the Board gains jurisdiction over an interference. The section also indicates when an interference becomes a contested case within the meaning of 35 U.S.C. 24. A remand to the examiner is authorized and may be useful in certain situations, such as, when a party moves under § 1.633(c) to add a proposed count which is broader than any count in an interference. Alternatively, an examiner-in-chief would be able to obtain informal opinions from examiners during the course of an interference. Nothing in the rules, however, is intended to authorize informal conferences between an examiner-in-chief and an examiner with respect to the merits of an application before the board in an *ex parte* appeal from an adverse decision of the examiner.

Section 1.616 permits an examiner-in-chief or the Board to impose appropriate sanctions against a party who fails to comply with the rules or with an order entered in the interference. Paragraphs (a) through (e) set forth some of the possible sanctions which can be entered. The particular sanction to be entered would depend on the facts of a given case and ordinarily would not be entered prior to giving the affected party an opportunity to present its views. An individual examiner-in-chief could not impose sanction granting judgment inasmuch as entry of a judgment requires action by the Board. See § 1.610(a). A party desiring sanctions imposed against an opponent could move under § 1.635 for entry of an order imposing sanctions.

Section 1.617 retains summary judgment proceedings in those cases where a junior party applicant is required to file evidence and an explanation under § 1.608(b). To avoid summary judgment, the junior party applicant must establish that it is *prima facie* entitled to judgment relative to the senior party patentee. For the most part, practice under § 1.617 will be the same as the current practice under 37 CFR 1.228. The major changes would be the following: (1) A *prima facie* case could be based on patentability as well as priority. (2) A stricter standard would be imposed for presenting additional evidence after entry of an order to show cause. Under current practice (37 CFR

1.228), additional evidence may be submitted with a response to an order to show cause "when a showing in excuse of . . . [its] omission from the original" showing is made. The "good cause" showing required by § 1.617(b) imposes a stricter standard than was required under the prior rules. The stricter standard is necessary to encourage applicants copying claims from a patent to better prepare their initial showings under proposed § 1.608(b). Under current practice, the Board of Patent Interferences has found that substantial time is lost in issuing orders to show cause based on an inadequate initial showing only to have an adequate showing made with the response to the order to show cause. Under the "good cause" standard, ignorance by a party or counsel of the provisions of the rules or the substantive requirements of the law would not constitute good cause. (3) When an interference involves more than two parties, all opponents would be permitted to participate in summary judgment proceedings. Thus, the new rules overrule *Chan* v. *Akiba* v. *Clayton*, 189 USPQ 621 (Comm'r. Pat. 1975). (4) Currently, and applicant must file two copies of its initial showing under 37 CFR 1.204(c). Under § 1.608(b), a party would file only one copy of the showing. However, any party responding to an order to show cause would be required to serve a copy of its initial showing under § 1.608(b) with any response to the order to show cause. (5) A single examiner-in-chief may order an interference to proceed after issuance of an order to show cause under § 1.608(b) and the filing of a response by an applicant under § 1.617(b). Only the Board, however, may enter a summary judgment. See § 1.617(b).

Under § 1.618, the PTO has authority to return to a party any paper presented in an interference which is not authorized by, or is not in compliance with the requirements of, Subpart E. When an improper paper is filed, a party may be given an opportunity to file a proper paper under such conditions as an examiner-in-chief may deem appropriate: Two examples of improper papers are: (1) Replies to replies which are not authorized by the rules and (2) papers presented which have attached thereto a paper previously filed in the interference.

Sections 1.621 through 1.629 govern preliminary statements which continue to be required in interference cases.

Under § 1.621, a preliminary statement can be signed by any individual having knowledge of the facts (e.g., the inventor) or by an attorney or agent of record. Permitting an attorney or agent of record to sign a preliminary statement eliminates unnecessary mailing of papers between parties and their attorney or agent.

Under § 1.622, the preliminary statement would identify the inventor who made the invention defined by each count. If the inventor identified in the preliminary statement is not an inventor named in the application or patent involved in the interference, a motion under § 1.634 must be diligently filed to correct inventorship.

Sections 1.623, 1.624, and 1.625 respectively set out the allegations which should be made in, and the attachments which should accompany, a preliminary statement when (1) the invention was made in the United States, (2) the invention was made abroad and was introduced into the United States, and (3) derivation by an opponent from a party is to be an issue.

Section 1.626 permits a party to file a preliminary statement which states that the party only intends to rely on the filing date of an earlier United States or foreign application. Ordinarily, a junior party who fails to file a preliminary statement is not entitled to access to any other preliminary statement filed (see § 1.631(b)). Section 1.626 would permit a junior party who only intends to rely on an earlier application to have access to any opponent's preliminary statement.

Section 1.628 sets out how an error in a preliminary statement may be corrected.

Section 1.629 sets out the effect of a preliminary statement. A party who fails to file a preliminary statement will not be permitted to prove (1) that the party made the invention defined by a count prior to the party's filing date or (2) that an opponent derived the invention from the party.

Under § 1.631, preliminary statements normally will be opened for inspection when an examiner-in-chief decides preliminary motions filed under § 1.633. A junior party who does not file a preliminary statement is not entitled to access to a preliminary statement of any other party. When an interference is terminated before preliminary statements are opened, any preliminary statement which has been filed will be returned unopened to the party who submitted the statement.

Under § 1.632, a notice must be filed by a party who intends to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice. 35 U.S.C. 102(g). A party will not be permitted to brief (§ 1.656) or argue at final hearing (§ 1.654) that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless the notice is timely filed. A notice is timely if filed within ten (10) days of the close of the testimony-in-chief period of an opponent. while a party has the burden of proving that an opponent abandoned, suppressed, or concealed, the burden may be discharged on the basis of the opponent's evidence alone. *Shindelar* v. *Holdeman*, 628 F.2d 1337, 207 USPQ 112 (CCPA 1980). See also *Correge* v. *Murphy*, 705 F.2d 1326, 217 USPQ 753 (Fed. Cir. 1983); *Horwath* v. *Lee*, 564 F.2d 948, 195 USPQ 701 (CCPA 1977); and *Peeler* v. *Miller*, 535 F.2d 647, 190 USPQ 117 (CCPA 1976). Under current practice where notice is not required, it is possible that a party may learn for the first time that abandonment, suppression, or concealment is an issue when the party receives an opponent's brief at final hearing. See *Klug* v. *Wood*, 212 USPQ 767, 771 n. 2 (Bd.Pat.Int. 1981). At that point, it is often too late to reopen proceedings in the interference. The purpose of requiring the notice under § 1.632 is to make the parties and the Board aware during the interlocutory stage of an interference that abandonment, suppression, or concealment may be an issue in the interference. Early notice will permit the parties to ask for and the examiner-in-chief to set appropriate testimony periods for a party to present evidence related to abandonment, suppression, and concealment, particularly in those cases where long unexplained delays tend to prove the allegation of suppression or concealment. Early notice will also eliminate the need for the party moving to reopen the testimony period. *Klug* v. *Wood*, *supra*.

Under § 1.633, a party may file preliminary motions for judgment, to redefine the interference, to substitute a different application in the interference, to declare an additional interference, to be accorded the benefit of an earlier application, to attack benefit previously accorded an opponent, or to add a reissue application to the interference. The motions are called "preliminary motions" in order to distinguish the motions from other motions which might be filed during the course of an interference. The preliminary motions would replace motions currently authorized by 37 CFR 1.231.

Under § 1.633(a), a motion to dissolve would be replaced with a motion for judgment. A party can file a motion for judgment on the ground that an opponent's *claim* corresponding to a count is unpatentable to the opponent. With two exceptions, unpatentability can be based on prior art (35 U.S.C. 102,

103), insufficiency of disclosure (35 U.S.C. 112, first paragraph), indefiniteness of claims (35 U.S.C. 112, second paragraph), double patenting, estoppel, or any other ground which would support a holding that claims corresponding to a count are not patentable. The two exceptions are (1) priority of invention of the subject matter of a count by the moving party as against any opponent and (2) derivation of the subject matter of a count by the opponent from the moving party. The two exceptions are directed to issues which are traditional "priority" issues, e.g., which inventor made the invention defined by a count first or, when derivation is an issue, who made the invention. Resolution of those "priority" issues almost always requires the taking of testimony. A motion for judgment, however, would be proper when a party believed an individual not involved in the interference made the invention defined by the count prior to an opponent in the interference, but subsequent to the moving party. Thus, a patentability issue, such as that raised under 35 U.S.C. 102(g) in *Sutter Products Co.* v. *Pettibone Mulliken Corp.*, 428 F.2d 639, 166 USPQ 100 (7th Cir. 1970). properly could be raised with a motion for judgment under § 1.633(a). Derivation by an opponent from an individual not involved in the interference could also be raised under § 1.633(a).

Under § 1.633(b), a party could move for a judgment when the party believes there is no interference-in-fact. A motion for judgment on the ground of no interference-in-fact is only proper under one of three conditions: (1) When an interference involves designs, (2) when the interference involves plant applications or a plant application and plant patent, or (3) when no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. An example illustrates when a motion under § 1.636(b) is proper.

Example 20. Application AD contains patentable claim 1 (6-cylinder engine). Application AE contains patentable claim 3 (8-cylinder engine). An interference is declared with a single count (6 or 8-cylinder engine). Claim 1 of application AD and claim 3 of application AE are designated to correspond to the count. Applicant AD believes that a 6-cylinder engine is a "separate patentable invention" (see § 1.601(n)) from an 8-cylinder engine. Applicant AD would file a motion under § 1.633(b) for a judgment on the ground of no interference-in-fact stating why a 6-cylinder engine is patentably distinct from an 8-cylinder engine. If the Board ultimately agrees with applicant AD, a patent could issue to AD containing claim 1 of application AD and a second patent could issue to AE containing claim 3 of application AE.

Under §1.633(c), a party may move to redefine interfering subject matter. One way to redefine interfering subject matter would be to add or substitute a count. When a party seeks to add a count, the party is required to demonstrate that the proposed count to be added is directed to a "separate patentable invention" from every other count in the interference.

A motion may be filed to amend an application claim which has already been designated to correspond to a count. See § 1.633(c)(2). Such a motion might be filed when a party believes an application claim designated to correspond to a count is unpatentable and the amended claim is believed to be patentable.

An applicant may move to add a claim to the applicant's application and to designate the claim to be added to correspond to a count. See § 1.633(c)(2). Such a motion may be filed when the applicant discloses specific subject matter which is not claimed, would like to claim the subject matter, and wants the subject matter involved in the interference.

Another way to redefine interfering subject matter would be to designate a claim as corresponding or not corresponding to a count. See §1.633 (c)(3) and (c)(4). Examples 21 and 22 illustrate this latter point.

Example 21. Application AF contains patentable claim 1 (engine). Patent K contains claims 3 (engine) and 5 (6-cylinder engine). Claim 1 of application AF and claim 3 of patent K are designated to correspond to the count. Applicant AF believes a 6-cylinder engine is the "same patentable invention" (see § 1.601(n)) as engine. Applicant AF would file a motion under § 1.633(c)(3) to designate claim 5 of patent K as corresponding to the count. If the motion is granted and applicant AF prevails in the interference, judgment would be entered against patentee K and both claims 3 and 5 of patent K would be cancelled under 35 U.S.C. 135(a).

Example 22. Application AG contains patentable claim 1 (engine). Patent L contains claims 3 (engine) and 5 (8-cylinder engine). An interference is declared with one count (engine). Claim 1 of application AG and claims 3 and 5 of patent L are designated to correspond to the count. Patentee L believes that an 8-cylinder engine defines a "separate patentable invention" (see § 1.601(n)) from engine. Patentee L should file a motion under § 1.633(c)(4) to designate claim 5 of patent L as "not corresponding" to the count. If the motion is granted and an adverse judgment is entered against patentee L, only claim 3 would be cancelled from the patent pursuant to 35 U.S.C. 135(a).

A motion to redefine the interfering subject matter may also request that an opponent who is an applicant be required to add a claim to the opponent's application and to designate the claim to correspond to a count. See § 1.633(c)(5). Such a motion might be filed when a party sees that the opponent discloses, but does not claim, subject matter which the party believes should be involved in the interference.

Section 1.633(i) would continue present practice (37 CFR 1.231) of allowing a party to move to redefine the subject matter of the interference or substitute a different application when an opponent moves for judgment (see § 1.633(a) and (b)) or to attack benefit (see § 1.633(g)).

Paragraph (j) of § 1.633 will permit an opponent to move for benefit when a party moves to add or substitute a count. Thus, when a motion to add a count is filed by a party and an opponent wants benefit of an earlier application in the event the motion to add is granted, the opponent should file a motion under § 1.633(j) to be accorded benefit. The mere fact that the opponent had been accorded benefit of an earlier application when the interference was declared does not mean the opponent will be accorded benefit as to some other count which may be added on motion of some other party.

Section 1.634 authorizes a motion to correct inventorship in an application (see § 1.48) or a patent (see § 1.324) involved in an interference.

Section 1.635 authorizes the filing of motions other than those specified in §§ 1.633 or 1.634. Motions filed under § 1.635 would be referred to as "miscellaneous motions" to distinguish from "preliminary motions" under § 1.633. Instances where a miscellaneous motion would be filed include motions to correct an error in a preliminary statement, to extend time for taking action or to seek judicial review, to obtain permission to proceed under 35 U.S.C. 24, or to obtain additional discovery.

Section 1.636 sets out the times within which a motion would be filed.

Section 1.637 sets out the content of motions. In prior interference practice, parties and their counsel have had difficulty meeting all the "unwritten"

requirements for motions under 37 CFR 1.231. Section 1.637 is quite specific in setting out the requirements for each type of motion, particularly the preliminary motions. By setting out with specificity the requirements for each type of motion, it is intended to minimize disposition of motions on technicalities. A vast majority of the comments in response to the advanced notice published in the **Federal Register** on August 1, 1983, commenting on then proposed § 1.637 were in favor of the requirements for motions being specifically set out in the regulations.

Section 1.638 authorizes oppositions to motions. Any opposition would have to identify any material fact in dispute. A reply to an opposition would be authorized for all motions. A reply to a reply is not authorized.

Section 1.639 sets forth the evidence which may accompany a motion, opposition, or reply. Every material fact alleged in a motion, opposition, or a reply would have to be supported by proof. Section 1.639(b) authorizes affidavits to be used as proof for any motion. The affidavit may later be used by a party during the testimony period (see §§ 1.671(e) and 1.672(b)). When a party believes that testimony is necessary to decide a motion under § 1.633 or § 1.634, the party would have to describe the nature of the testimony needed. If an examiner-in-chief agrees that testimony is needed, appropriate interlocutory relief would be granted and testimony would be ordered.

Example 23. An interference is declared with one count between application AH and application AJ. Applicant AH files a preliminary motion under § 1.633(c)(1) to redefine the interference by adding a second count. In order to succeed, applicant AH must show that the proposed count to be added is directed to a "separate patentable invention" (see § 1.601(n)) from the count already in the interference. In the motion, applicant AH sets forth in detail the testimony which would be required to prove that the subject matter of the proposed count is to a separate patentable invention from the subject matter of the count in the interference. Applicant AJ opposes the motion on the ground that the proposed and present counts define the "same patentable invention" (see § 1.601(n)). An examiner-in-chief determines that a material fact is in dispute and that applicant AH has established testimony is needed to properly rule on the motion. Under the circumstances, the motion would be deferred to final hearing and a testimony period would be ordered. The questions of (1) whether the proposed and present counts define the same patentable invention and (2) priority would be decided at final hearing.

Under § 1.640, an examiner-in-chief would decide all motions. A hearing could be held on a motion in the discretion of an examiner-in-chief. Where appropriate, an examiner-in-chief could consult with an examiner on a question of patentability which arises in the first instance in the interference. Consulation would not be necessary where the examiner had already ruled on the patentability question which comes before the examiner-in-chief or the Board. Moreover, nothing in § 1.640 authorizes conferences between examiners-in-chief and examiners in *ex parte* appeals under 35 U.S.C. 134 from an adverse decision of an examiner. A party is entitled to request reconsideration of a decision on a motion by a single examiner-in-chief. An opposition to a request for reconsideration could not be filed unless ordered by an examiner-in-chief or the Board, but the decision by the single examiner-in-chief would not normally be modified unless an opposition has been requested. The request for reconsideration would be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom would normally be the examiner-in-chief who decided the motion. Several comments were received in response to the advance notice questioning why the examiner-in-chief who decided the motion would form part of the panel deciding the request for reconsideration. The decision to propose, and now adopt, a regulation which would permit the examiner-in-chief who decided the motion to participate in the decision on reconsideration was made after careful balancing of all the factors involved. It could have been proposed to permit the examiner-in-chief to individually decide the request for reconsideration. However, it is believed that parties in interference cases would feel that their requests for reconsideration are being more fully considered if more than one person considers their request. The two additional examiners-in-chief would be able to consult with the examiner-in-chief most familiar with the case, but would be able to control the decision on reconsideration by a majority vote. Use of the examiner-in-chief who decided the motion and two additional examiners-in-chief would (1) minimize delay which would occur if three new examiners-in-chief were used who were unfamiliar with the record and (2) minimize the possibility that reversible error occurred if only the examiner-in-chief who decided the motion also individually decided the request for reconsideration.

Under § 1.644, petitions to the Commissioner are authorized in interference cases under certain restricted conditions. Petitions in interferences have been the source of substantial delay. Section 1.644 attempts to minimize those delays. Section 1.644 authorizes a petition to the Commissioner from a decision of an examiner-in-chief or a panel when the examiner-in-chief or the panel shall be of the opinion (1) that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (2) that an immediate decision on petition would materially advance the ultimate termination of the interference. The standard is intended to be analogous to that of a district court certifying a question to a court of appeals under 28 U.S.C. 1292(b). A petition could be filed seeking to invoke the supervisory authority of the Commissioner. However, the petition could not be filed prior to entry of judgment and could not relate to the merits of priority or patentability or the admissibility of evidence under the Federal Rules of Evidence. A petition could also be filed seeking waiver of a rule. A fee of $120 would be charged for each petition and for each request for reconsideration of a decision on petition. Any petition would be decided on the record made before the examiner-in-chief or the Board and additional evidence could not be submitted with the petition. An opposition could not be filed unless ordered by the Commissioner. Where reasonably possible, service of a petition would have to be such that delivery is accomplished within one day. Service by hand or "Express Mail" would comply with this requirement.

Section 1.645 permits a party to file a motion to seek an extension of time to take action in an interference or to seek judicial review. The motion would have to be filed within sufficient time to actually reach an examiner-in-chief prior to expiration of the time for taking action. Under § 1.645, a moving party would not be able to assume that a motion for an extension of time would be granted. Under § 1.610(d)(6), a request for an extension of time could be made orally and an appropriate order would then be entered thus eliminating considerable paper work. The order would be the written record of the request and decision. See § 1.2. Extensions of time have caused numerous delays in interference cases.

Under present interference practice, some delays are caused because attorneys and agents on many occasions unexpectedly receive orders setting times. Under the new practice, attorneys and agents can expect times to be set for filing preliminary statements, preliminary motions, motions for additional discovery, testimony, and briefs after a conference call. It is expected that use of conference calls will permit an examiner-in-chief and attorneys or agents for parties to set a time schedule which is mutually satisfactory. A motion to extend time would not be granted unless a party shows good cause. The use of conference calls would allow schedules to be set before orders setting time are entered and therefore the press of other business which arises after the examiner-in-chief and attorneys and agents agree to times would not normally be considered good cause.

Under § 1.647, when a party relies on a document in a foreign language, an English language translation of the document and an affidavit attesting to the accuracy of the translation would be required. The rule would apply to any document, including evidence submitted with motions, foreign applications for which a party seeks benefit, testimony, and exhibits introduced in evidence during testimony.

Under § 1.651, after a decision is entered on preliminary motions, an examiner-in-chief would set times for filing motions for additional discovery and for taking testimony. Any motion for additional discovery would be to obtain answers to interrogatories, requests for admissions, and documents and things necessary for a party to prepare its case-in-chief.

Section 1.653 sets out what shall be in the record to be considered by the Board at final hearing. The record would continue to be printed or typed on paper 8½″ by 11″ in size. Accordingly, when a party files an affidavit, the party should use 8½″ by 11″ paper for the affidavit.

Section 1.654 continues the practice of holding a final hearing where oral argument may be presented by all parties. No fee would be charged for appearing at oral argument at final hearing in an interference.

Section 1.655 specfies the matters which can be considered in rendering a final decision. Patentability is an issue which may be raised. The Board can also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion, although any interlocutory order would be presumed to be correct and burden of showing error shall be on the party attacking the order. This last procedural provision permits the Board to correct any manifest error before a party seeks judicial review of an interlocutory order along with judicial review of the Board's final decision.

Section 1.656 sets forth the requirements for briefs for final hearing. In large measure, § 1.656 follows the requirements of Rule 28 of the Federal Rules of Appellate Procedure. An original and three copies of a brief is required. Under § 1.656(h), if a party wants the Board in rendering its final decision to rule that any evidence is inadmissible, the party must file with its opening brief an original and three copies of a motion to suppress the evidence. Any previous objection to the admissibility of evidence is waived unless the motion to suppress is filed. This procedural provision makes clear that an objection to the admissibility of evidence must be renewed at final hearing and will be considered by the Board in rendering its final decision. When a junior party fails to file a brief, an order can be issued requiring the junior party to show cause why failure to file the brief should not be taken as a concession of priority.

Under § 1.658 the Board would enter a final decision. The decision can (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing claims which correspond to the count. When judgment is entered as to all counts, the decision of the Board is considered final for the purpose of judicial review. Section 1.658(c) defines the doctrine of interference estoppel as it is to be applied in the PTO after an interference is terminated. The definition of interference estoppel is designed to encourage parties in interference cases to settle as many issues as possible in one proceeding. Section 1.658(c) creates an estoppel both as to senior and junior parties unlike the present practice (37 CFR 1.257) which limits estoppel in some instances to junior parties. An estoppel would *not* apply with respect to any claims which correspond, or which properly could have corresponded, to a count as to which the party was awarded a favorable judgment. A few examples illustrate how estoppel would be applied.

Example 24. Junior party applicant AL and senior party applicant AK both disclose separate patentable inventions "A" and "B" and claim only invention A in their respective applications. An interference is declared with a single count to invention A. Neither party files a preliminary motion (see § 1.633(c)(1)) to add a count to invention B. Judgment as to all of AL's claims corresponding to the sole count is awarded to junior party applicant AL. Senior party applicant AK would be estopped to thereafter obtain a patent containing claims to invention B, because applicant AK failed to move to add a count to invention B in the interference. Junior party applicant AL would not be estopped to obtain a patent containing claims to invention B.

Example 25. In this example, the facts are the same as in Example 24 except that judgment is awarded as to all AK's claims corresponding to the count to senior party applicant AK. Junior party applicant AL would be estopped to obtain a patent containing claims to invention B in the interference. Senior party applicant AK would not be estopped to obtain a patent containing claims to invention B.

Example 26. Junior party applicant AM and senior party applicant AP both disclose separate patentable inventions "C", "D", and "E" and claim inventions C and D in their respective applications. An interference is declared with two counts. Count 1 is to invention C and Count 2 is to invention D. Neither party files a preliminary motion to add a proposed Count 3 to invention E. Judgment as to all AM's claims corresponding to Counts 1 and 2 is awarded to junior party applicant AM. Senior party applicant AP would be estopped to thereafter obtain a patent containing claims to invention E, because applicant AP failed to move to add a count to invention E in the interference. Junior party applicant AM would not be estopped to obtain a patent containing claim to invention E.

Example 27. In this example, the facts are the same as in Example 26 except that judgment is awarded as to all AP's claims corresponding to Counts 1 and 2 to senior party applicant AP. Junior party applicant AM would be estopped to obtain a patent containing claims to invention E, because applicant AM failed to move to add a count to invention E in the interference. Senior party applicant AP would not be estopped to obtain a patent containing claims to invention E.

Example 28. In this example, the facts are the same as in Example 26 except that judgment is awarded on all of AM's claims corresponding to Count 1 to junior party applicant of AM and judgment is awarded on all AP's claims corresponding to Count 2 to senior party applicant AP. Both parties would be estopped to obtain a patent containing claims to invention E, because neither moved to add a count to invention E during the interference. Assume that junior party AM could have properly moved under § 1.633(f) to be accorded the benefit of an earlier application, but did not do so during the interference. Junior party AM would not be estopped in subsequent *ex parte* prosecution from asking for benefit of the earlier application as to the invention defined by Count 1. Accordingly, if the examiner were to reject junior party AM's claim corresponding to Count 1 on the basis of some newly discovered prior art, junior party AM could properly antedate the prior art by seeking the benefit under 35 U.S.C. 120 of the earlier application. Thus, even though junior party AM was a "losing party" as to Count 2 (an adverse judgment as to junior party AM's claims corresponding to Count 2 having been entered), junior party AM was awarded a favorable judgment (§ 1.658(c)) as to Count 1. Junior party AM would be estopped in subsequent *ex parte* prosecution from attempting to be accorded the benefit of the earlier application as to the invention of Count 2.

Example 29. Applicant AQ discloses and claims invention "F." Applicant AR discloses and claims separate patentable inventions "F" and "G." The assignee of applicant AQ also owns an application AS which discloses and claims invention "G." An interference is declared between applicant AQ and applicant AR. The sole count is directed to invention F. No motion is filed by applicant AQ or its assignee to declare an additional interference between applicant AR and applicant AS with a count to invention G. A judgment as to all of AR's claims corresponding to the sole count is awarded to applicant AR. Applicant AS and the assignee would be estopped to obtain a patent containing claims to invention G, because applicant AR and the assignee failed to move to declare an additional interference with a count to invention G.

Example 30. The facts in this example are the same as the facts in Example 29 except that judgment as to all of AQ's claims corresponding the sole count is awarded to applicant AQ. Applicant AS and the assignee would not be estopped, because applicant AQ was not a "losing party" (§ 1.658(c)).

Example 31. Applicant AT discloses a generic invention to "solvent" and a species to "benzene." Application AT contains a patentable claim 1 (solvent) and no other claims. Applicant AU discloses the generic invention to "solvent" and species to "benzene" and "toluene." Application AU contains patentable claim 3 (solvent) and no other claims. An interference is declared with a single count (solvent). Claims 1 of application AT and claim 3 of application AU are designated to correspond to the count. No preliminary motions are filed. A judgment is entered in favor of applicant AT on the claim corresponding to the sole count. Applicant AU would be estopped to obtain a patent containing a claim to benzene, because applicant AU failed to file a preliminary motion under § 1.633(c)(1) seeking to add a count to benzene and benzene was disclosed in winning party AT's application. Applicant AU would also be estopped to obtain a patent containing a claim to toluene, unless "toluene" defines a "separate patentable invention" from "solvent." A basis for interference estopped (§ 1.658(c)) exists if "toluene" and "solvent" define the "same patentable invention," because a claim to "toluene" could properly have been added and designated to correspond to the count. See § 1.633(c)(2).

Under § 1.659, the Board would be able to make recommendations to examiners and the Commissioner, including recommendations that application claims not involved in the interference be rejected and that a patent be reexamined as to patent claims not involved in the interference.

Under § 1.660, a party would be required to notify the Board when the party's patent or application becomes involved in other PTO proceedings (reexamination, reissue, or protest) or litigation.

Section 1.661 sets forth when an interference is considered terminated after a judgment is entered in the interference. For the purpose of filing copies of settlement agreements, an interference is considered terminated when the time for all appeals has expired. *Tallent* v. *Lemoine*, 204 USPQ 1058 (Comm'r . Pat. 1979). See also *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r. Pat. 1981).

Section 1.662 provides that a party may request that an adverse judgment be entered. The section also provides that when a written disclaimer (not a statutory disclaimer), concession of priority or unpatentability, abandonment of the invention, abandonment of an application, or abandonment of the contest is filed, the disclaimer, concession, or abandonment would be treated as a request for entry of an adverse judgment. Section 1.662(b) provides that when a patentee files a reissue application and omits all claims of a patent corresponding to the counts of an interference for the purpose of avoiding the interference, judgment would be entered against the patentee. Under § 1.662(c), the filing of a statutory disclaimer would not be treated as a request for entry of an adverse judgment unless all patent claims corresponding to a count are disclaimed. Under § 1.662(d), if after entry of a judgment or after filing of a statutory disclaimer no interference exists, the interference would be terminated as to any party against whom judgment has not been entered and any further prosecution of any application involved in the interference would be *ex parte* before the examiner.

Section 1.666 sets out the procedure for filing settlement agreements in interference cases. The PTO is merely a repository for copies of agreements filed under 35 U.S.C. 135(c) and does not undertake to rule on whether the statute requires that a copy of any particular agreement be filed. *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r.Pat. 1981).

Section 1.671 sets out what would be considered evidence. The Federal Rules of Evidence, with certain exceptions, are made applicable to interference cases. Under § 1.671(e), a party cannot rely on a previously filed affidavit unless the affidavit is served and notice is given that the party intends to rely on the affidavit. The purpose for the notice is to permit an opponent to determine whether a deposition for cross-examination is necessary (see §§ 1.672(b) and 1.673(e)).

Section 1.671(e) is intended to overrule prior construction of PTO rules in *Holmes* v. *Kelly*, 586 F.2d 234, 237 n. 7, 199 USPQ 778, 782 n. 7 (CCPA 1978) and *Brecker* v. *Jennings*, 204 USPQ 663 (Bd.Pat. Int. 1978), which considered a Rule 132 affidavit in the file of an involved application to be part of the "record" in an interference. Under § 1.671(e), a party intending to rely on such an affidavit must give notice and serve a copy of the affidavit on the opponent.

Under § 1.671(f), the significance of documentary and other exhibits must be discussed with particularity by a witness during oral deposition or in an affidavit. Section 1.671(f) sets out in the regulations an evidentiary requirement imposed by precedent. See *Popoff* v.

Orchin, 144 USPQ 762 (Bd.Pat. Int. 1963) (unexplained experimental data should not be considered); *Chandler* v. *Mock*, 150 F.2d 563, 66 USPQ 209 (CCPA 1945) (records standing alone were held to be meaningless), and *Smith* v. *Bousquet*, 111 F.2d 157, 45 USPQ 347 (CCPA 1940) (unexplained tests in stipulated testimony are entitled to little weight). See also *In re Borkowski*, 505 F.2d 713, 184 USPQ 29 (CCPA 1974) and *Triplett* v. *Steinmayer*, 129 F.2d 889, 54 USPQ 409 (CCPA 1942). Under § 1.671(g), a party is required to obtain permission from an examiner-in-chief prior to proceeding under 35 U.S.C. 24. This requirement insures that a subpoena is necessary (e.g., a subpoena ordinarily should not be necessary where testimony of an opponent is sought) and that testimony sought through a section 24 subpoena is relevant before a subpoena is issued. The motion seeking permission to proceed under section 24, any opposition thereto, and the order of an examiner-in-chief authorizing the moving party to proceed under section 24 will be of assistance to a federal court in the event a party is required to resort to a court to enforce the subpoena or to compel answers to questions propounded at any deposition where a witness is appearing pursuant to a subpoena. See *Sheehan* v. *Doyle*, 529 F.2d 38, 188 USPQ 545 (1st Cir.), *cert. denied*, 429 U.S. 870 (1976), *rehearing denied*, 429 U.S. 987 (1976).

Under § 1.671(h), any evidence which is not taken or sought and filed in accordance with the regulations will not be admissible.

Section 1.672 sets forth the manner in which testimony shall be taken. Testimony can be taken by deposition or affidavit at the election of the party presenting the testimony. A party presenting testimony by affidavit must file and serve the affidavit. If the party presents testimony by affidavit and an opponent elects to cross-examine the affiant, the party is required to notice a deposition for the purpose of cross-examination. Re-direct and re-cross will take place at the deposition. Where the parties agree, testimony can be presented by affidavit without opportunity for cross-examination (see § 1.672(e)) or by an agreed statement of facts (see § 1.672(f)).

Section 1.673 sets out how a deposition must be noticed. A deposition can be noticed for any reasonable place in the United States. The extent to which parties, witnesses, and attorneys or agents have to travel may be considered in determining whether a place is reasonable. Prior to serving a notice for a deposition, a party is required to take two procedural steps. Under § 1.673(b), a party would be required to serve a copy of the documents and a list of the things in its possession, custody, and control upon which it intended to rely. Under § 1.673(g), the party is required to have an oral conference (in person or by telephone) with all opponents to attempt to agree on a mutually acceptable time and place for taking the deposition. An examiner-in-chief may set the time and place if agreement is not reached. A single notice listing all the witnesses and the general nature of their expected testimony is then served. Under § 1.673(c) and except as provided, a party can not rely on any witness not mentioned in the notice, any document not served, or any thing not listed. Under § 1.673(h), a copy of any notice must be attached to the certified transcript of each deposition filed.

Section 1.674 sets out the persons before whom depositions can be taken.

Section 1.675 sets out how a deposition is to be taken.

Section 1.676 sets out how a court reporter should prepare and file a certified transcript of a deposition. Section 1.676(d) sets out how exhibits are to be marked for identification, used at depositions, and filed. Provisions similar to those of Rule 30(f)(1)(A) and (B) of the Federal Rules of Civil Procedure are applicable to interferences.

Section 1.677 sets out the form of a transcript of a deposition.

Under § 1.678, a transcript of a deposition must be filed in the PTO within 45 days of the date of the deposition.

Section 1.682 sets out how a party may introduce in evidence, if otherwise admissible, official records or printed publications. When a notice is served, a party is also required to serve (but not file) copies of the official records and printed publications. Any objection to the notice or to the admissibility of any official record or publication must be filed within 15 days of the date of service of the notice.

Section 1.683 sets out how a party may use testimony from another interference or proceeding.

Section 1.684 sets out how a party may take testimony in a foreign country.

Section 1.685 sets out how objections during the taking of depositions must be raised. Under § 1.685(a), an error in a notice of deposition is waived unless a motion to quash the notice is filed as soon as the error is, or could have been, discovered. Under § 1.685(b), any objection to the qualifications of an officer is waived unless (1) the objection is noted on the record of the deposition before a witness begins to testify or (2) if discovered after the deposition, a motion to suppress is filed as soon as the objection is, or could have been, discovered. Under § 1.685(c), any error in the manner in which testimony is transcribed, the transcript is signed by a witness, or the transcript is prepared or otherwise handled by the court reporter is waived unless a motion to suppress is filed as soon as the error is, or could have been, discovered. Under § 1.685(d), any objection on the merits to the admissibility of evidence (e.g., under the Federal Rules of Evidence) is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Often objections are cured by subsequent testimony. Accordingly, any objection which a party wants the Board to consider at final hearing must also be made the subject of a motion under § 1.656(h).

Section 1.687 sets out how a party could seek and obtain additional discovery. "Additional discovery" is defined in § 1.601(a). Section 1.687 does not change the standard ("interest of justice") for obtaining discovery.

Section 1.688 sets out how a party can introduce into evidence admissions and answers to interrogatories obtained as a result of additional discovery.

Changes in Text

Several changes have been made to the text of the proposed rules published in the **Federal Register** on January 30, 1984. The changes are discussed below. Additional rationale for the changes are further discussed under the heading "Analysis of Comments."

All references to the "Board of Appeals and Interferences" have been changed to "Board of Patent Appeals and Interferences" in view of Pub. L. 98-622.

In § 1.11(a) the language "or after termination of an interference without an award of judgment" has been deleted. This change has been made in view of changes made in paragraphs (c) and (d) of § 1.662.

In response to comment, the fee required for a petition in an interference under § 1.644(e) and a request for reconsideration of a decision on petition in an interference under § 1.644(f) have been set out as separate items.

Section 1.136 was changed to refer to § 1.611 rather than § 1.610(a).

The following sentence was inadvertently omitted as the third sentence of § 1.138 in the notice of proposed rulemaking: "A registered attorney or agent acting under the

provision of § 1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application." This sentence presently appears in § 1.138.

In 1.196(d), second sentence, "thirty days" has been changed to "one month".

In 1.197(b), "thirty days" has been changed to "one month".

In the last sentence of § 1.304, "The Commissioner" has been changed to "An examiner-in-chief" and "of a decision of the Board of Patent Appeals and Interferences in an interference case" has been inserted after "time for seeking judicial review." This change is made to limit the "excusable neglect" standard to interference cases only.

In § 1.601(j), the language "all the claims of a party which correspond" has been changed to read "at least one claim of a party which corresponds". The language "all the claims of an opponent which correspond" has been changed to read "at least one claim of an opponent which corresponds".

Section 1.605(a) has been changed by deleting from the third sentence the language "a claim which is the same or substantially the same as" and by adding the following sentence as the fourth sentence: "At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." In the second sentence, "30 days" has been changed to "one month".

In the last sentence of § 1.606, the language "to define one patentable invention" has been changed to read: "not to contain separate patentable inventions."

The word "and" has been inserted in § 1.607(a) before "(3)". The word "must" in the first sentence of §1.607(c) has been changed to "shall" in response to a suggestion in a comment.

Pursuant to two separate suggestions, the following is being added after the first sentence in § 1.608(b): "Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To facilitate preparation of a record (§ 1.653 (g) and (h) for final hearing, an applicant should file affidavits on paper which is 8½ by 11 inches (21.8 by 27.9 cm.)."

In § 1.609(b) (1), the language "count or counts" has been changed to "proposed count or counts". In § 1.609(b) (2), each occurrence of "the count" has been changed to "each count".

In § 1.613(a), "§ 1.344" has been changed to "this Chapter." This change is being made to obviate the need to again amend § 1.613 in the event new rules relating to practice before the PTO are issued. See the notice of proposed rulemaking published in the **Federal Register** on August 24, 1984, 49 FR 33790, proposed §§ 10.62 and 10.66. The language "or members of the same firm of attorneys or agents" has been added after "agent" in § 1.613(b).

In § 1.615(a), second sentence, "which are" has been deleted and "in the interference" has been added after "will not be entered or considered".

Several changes have been made in § 1.617. In § 1.617(a), the language "the interference shall proceed before the examiner-in-chief" has been changed to read: "the interference shall proceed in the normal manner under the regulations of this part". The second sentence of § 1.617(b) ("A response may include a request by the applicant for a hearing before the Board.") has been changed to read: "Any request by the applicant for a hearing before the Board shall be made in the response." This change was made to clarify when and how a hearing must be requested by the applicant. The second sentence of § 1.617(d) has been changed to read: "The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." Section 1.617(e) has been re-written as follows: "Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." The language "examiner-in-chief or the" has been added after "by the applicant is timely filed, the" in the first sentence of § 1.617(g). The language "Board decides that" has been deleted from the second sentence of § 1.617(g). The language "If the Board decides otherwise" has been replaced with "Otherwise" in the third sentence of § 1.617(g). The language "before the examiner-in-chief" in the third sentence of § 1.617(g) has been changed to read: "in the normal manner under the regulations of this part." These changes will authorize either an examiner-in-chief or a Board to authorize an interference to proceed under § 1.617(g). It will continue to be necessary for the Board to enter an order *granting* summary judgment. In the last sentence of § 1.617(h), "patentee" has been changed to "any opponent".

The language "the name of" has been deleted from the first sentence of § 1.622(a). The second sentence of § 1.622(a) in the notice of proposed rulemaking ("When an inventor identified in the preliminary statement is not identical to the inventor named in the party's application or patent, the party shall file a motion . . . .") has been changed to read: "When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion . . . ." This change is being made in view of section 105(a) of Pub. L. 98–622 which amended 35 U.S.C. 116 to permit joint inventors to be named "even though . . . (3) each did not make a contribution to the subject matter of every claim . . . ."

The following changes have been made in § 1.623(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written description" has been changed to "copy of the first written description". In the third sentence, "when a drawing or written description" has been changed to "when a copy of the first drawing or first written description".

Several changes have been made to § 1.624. The following has been added as a second sentence in § 1.624(a)(5): "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." The following changes have been made in § 1.624(c). Each occurrence of "was made" has been changed to "was introduced into the United States." In the first sentence, "copy of the drawing" has been changed to "copy of that drawing". In the second sentence, "copy of the written description" has been changed to "copy of that written description". In the third sentence, "a drawing or written description" has been changed to "a copy of the first drawing or first written description introduced in the United States".

The following changes have been made in § 1.625(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written

description" has been changed to "copy of the first written description". In the third sentence, "a drawing or written description" has been changed to "a first drawing or first written description".

The language of § 1.628(b) which read: "because the drawing or written description is not in the party's possession, custody, or control, the party may file a motion . . . to amend its preliminary statement promptly after it secures possession, custody, or control of a copy of the drawing or written description" has been changed to read as follows: "the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion . . . to amend its preliminary statement promptly after the first drawing, first written description or drawing or written description first introduced into the United States becomes available."

The first sentence ("A preliminary statement should be carefully prepared.") has been deleted from § 1.629(a).

In § 1.629(b), the language "no earlier than" has been changed to "as early as".

In § 1.629(d), the following has been added after "allegation": "Unless the party complies with § 1.628(b)."

A new § 1.632 has been added to require a party to give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. A companion change has been made to § 1.654.

Two changes have been made to § 1.633(c). Paragraph (c)(2) has been changed by adding thereto the following language: "Or adding a claim in the moving party's application to be designated to correspond to a count". In addition, in § 1.633(c), the "or" before "(4)" has been deleted and the following has been added to the end of the first sentence: ", or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count."

Paragraph (j) has been added to § 1.633.

In § 1.636(b), "(i)" has been changed to "(i) or (j)" in view of the addition of paragraph (j) to § 1.633. The language "filed as soon as practical" in § 1.636(c) has been changed to "diligently filed" in order to conform § 1.636 to § 1.48. A party must exercise diligence in correcting inventorship. *Van Otteren* v. *Hafner*, 278 F.2d 738, 126 USPQ 151 (CCPA 1960).

Several changes have been made to § 1.637. The language "Where appropriate," has been deleted from the following paragraphs of § 1.637: (c)(1)(vi); (c)(2)(iv); (c)(3)(iii); (d)(4); (e)(1)(viii); (e)(2)(vii); and (h)(4). The following has been added in § 1.637(c)(2) before "shall": "or adding a claim to be designated to correspond to a count". The language "amended claim" in § 1.637(c)(2)(i) has been changed to read: "amended or added claim". The language "Apply the terms of each proposed claim to the disclosure of the application" in § 1.637(c)(2)(ii) has been changed to read: "Show that the proposed or added claim defines the same patentable invention as the count." The language "proposed amended claim" in § 1.637(c)(2)(iii) has been changed to read "amended or added claim." The language "adding the proposed claim" in § 1.637(c)(2)(iii) has been changed to read: "making the amended or added claim".

The word "interferences" in § 1.637(c)(4)(ii) has been corrected to read: "interference".

Subparagraph (c)(5) has been added to § 1.637.

The following has been added as the last sentence to § 1.637(f)(2): "If the earlier application filed abroad is not in English, the requirements of § 1.647 must also be met."

In paragraph § 1.637(f)(3), the language "discloses an embodiment with the scope" had been changed to read: "constitutes a constructive reduction to practice".

The first sentence, originally proposed in § 1.638(b) ("A reply to an opposition shall not be filed unless authorized by this subpart or an examiner-in-chief or the motion was filed under §§ 1.633 or 1.634"), has been deleted. The language "any authorized reply" in § 1.638(b) has been changed to "a reply".

The language "or a motion to correct inventorship under § 1.634" has been added to the first sentence of § 1.639(c) after "preliminary motion under § 1.633."

The following has been added after the first sentence of § 1.640(b)(1): "Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved." The fourth sentence of § 1.640(c) ("A request for reconsideration will ordinarily not be granted unless an opposition has been requested by an examiner-in-chief or the Board") has been changed to read: "A decision of a single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board." In the last sentence of § 1.640(c), the language "shall be decided by a panel" has been changed to read: "shall be acted on by a panel".

The word "application" in the paragraph heading and text of § 1.642 has been changed to read: "application or patent".

Three changes have been made in § 1.644. The following language has been added after "Commissioner" in § 1.644(a)(2): "and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence". The following language has been deleted from the second sentence of § 1.644(b): "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under the Federal Rules of Evidence". The language "A request for reconsideration will ordinarily not be granted unless" in the second sentence of § 1.644(f) has been changed to read: "The decision will not ordinarily be modified unless such".

Two changes have been made in § 1.645. The word "to" has been added before "file a notice of appeal" and "commence a civil action" in the first sentence of paragraph (a). The language, "accompanied by an affidavit," has been deleted from paragraph (b).

Three changes have been made to § 1.646. The word "service" has been added after "additional" in the third sentence of paragraph (b). The language "or except as otherwise provided by this part," has been added after "otherwise ordered by an examiner-in-chief," in paragraph (c). The language in paragraph (c) "paper may be made" has been changed to "paper shall be made". The word "time" has been changed to "date" in the last sentence of paragraph (e).

A new paragraph (c) has been added to § 1.654 to require that a party give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. Section 1.632 specifies the time within which the notice shall be filed.

Three changes have been made in § 1.658. The language "paragraph (a) of the section" in the last sentence of § 1.658(b) has been changed to "paragraph (a) of this section". The "(i)" in the first sentence of § 1.658(c) has been changed to "(j)" in view of the addition of § 1.633(j). In the notice of

proposed rulemaking, the second sentence of § 1.658(c) reads: "A party, other than a party awarded a favorable judgment as to all counts, who could have properly moved, but failed to move, under §§ 1.633 or 1.634, shall be estopped to take *ex parte* or *enter partes* action in the Patent and Trademark Office after the interference which is inconsistent with the party's failure to properly move." This sentence has been changed to read: "A losing party who could have properly moved, but failed to move, under § 1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment."

Several changes have been made in § 1.662. In § 1.662(a), the word "construed" has been changed to "treated." The first sentence of § 1.662(c) in the notice of proposed rulemaking read: "The filing of a statutory disclaimer under 35 U.S.C. 253 by a patentee will not be treated as a request for entry of an adverse judgment against the patentee, but will delete any statutorily disclaimed claims from being involved in the interference." That first sentence has been changed to read: "The filing of a statutory disclaimer under 35 U.S.C. 253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference." The second sentence of § 1.662(c) in the notice of proposed rulemaking read: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." That second sentence has been changed to read: "A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count." In view of this change, proposed § 1.662(d) has been deleted as unnecessary, and a change has also been made in § 1.11(a) to delete any reference to a termination of an interference by any means other than judgment.

The last sentence of § 1.671(g) has been changed from "The motion shall describe the general nature and show the admissibility in the interference of the testimony, document, or thing" to: "The motion shall describe the general nature and the relevance of the testimony, document, or thing."

Three changes have been made to § 1.672(b). In the second sentence after "witness by affidavit shall" the following has been added: ", prior to the close of the party's relevant testimony period." The language "file an affidavit" has been changed to "file and serve an affidavit." The following has been added after the third sentence: "A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on anything mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document."

Several changes have been made in § 1.673(b). The introductory sentence of paragraph (b) ("Unless the parties agree otherwise, at least three days prior to the conference required by paragraph (g) of this section, a party shall serve, but not file, the following:") has been changed to read: "Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:" In § 1.673(b)(1) the word "copy" has been changed to "list and copy."

In the last sentence of § 1.675(d), the language "signed by the witness in the presence of any notary" has been changed to read "signed by the witness in the form of (1) an affidavit in the presence of any notary or (2) a declaration." This change conforms § 1.675(d) to § 1.68.

In § 1.682(a)(4), ", where appropriate," has been added prior to "be accompanied" and "(§ 1.671(d))" has been added after "printed publication."

The word "admissible" in § 1.684(a)(4) has been changed to "revelant."

The following sentence has been deleted from § 1.687(b): "If the witness refuses to produce a requested document or thing, the party may file a motion (§ 1.635) for additional discovery under paragraph (c) of this section."

Section 1.688 has been revised to more clearly describe how a party may introduce in evidence an answer to a request for admission or an answer to a written interrogatory.

Analysis of Comments

Eighteen written comments were received. Three individuals testified at a hearing held on May 15, 1984. The following is an analysis of the written comments and the oral comments made at the hearing.

One comment suggested that § 1.8 not be amended to exclude from the certificate of mailing practice a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail." The comment argues that "[s]ome parties might not have an attorney in the Washington area or they may live in an area not serviced by Express Mail." The suggestion is not being adopted. Experience has shown that there are situations in interferences where it is desirable to have and the parties need a prompt ruling on a written motion. It is difficult for an examiner-in-chief to render a prompt ruling if the motion and any opposition are not promptly served and filed. In those situations where a party has no Washington, D.C. metropolitan area attorney or where a party resides in an area not served by "Express Mail," it may not be possible to hand-file or use "Express Mail." The examiner-in-chief would then exercise discretion by not invoking the exception of new subparagraph (xii) of § 1.8(a).

One comment suggested that it would be clearer if the fee for a petition in an interference and the fee for a request for reconsideration of a decision on petition in an interference were set out in § 1.17(h) as separate items. This suggestion has been adopted and the two fees have been set out in § 1.17(h) as separate items.

A suggestion was made that a reference be made in § 1.136 to § 1.611 rather than § 1.610(a). The suggestion is being adopted, because a reference to § 1.611 is believed to be more appropriate. Once an interference is declared involving an application, *ex parte* prosecution of the application is suspended and the applicant need not respond to any PTO action outstanding as of the date the interference is declared.

One comment made the following remark concerning § 1.196: "I do not understand the need or desire of the PTO to start the time to appeal to a Court from a PTO *final* decision on one claim, while PTO action is continuing on a second claim." As explained in the notice of proposed rulemaking (49 FR 3770, columns 2–3; 1039 O.G. 20–21; 1039 TMOG 20–21), when there are further proceedings before the examiner following a decision by the Board of Patent Appeals and Interferences, judicial review is not appropriate. Hence, under § 1.196, the PTO will not start a time for seeking judicial review of a PTO decision on one claim while PTO action is continuing on another claim. The last sentences of § 1.196(b)(1) and § 1.196(d) authorize the Board to enter an order making its decision final as to one claim when remand

proceedings as to another claim result in a favorable decision for the applicant. Section 1.196 is intended to eliminate piecemeal appeals.

With respect to § 1.292(c), one commentator said: "[a] party should be able to raise public use and [on] sale issues at any stage [of an interference proceeding] provided the issue is raised in a timely manner after learning of the use of sale." Public use and on sale issues are to be raised in interferences by way of a preliminary motion under § 1.633(a). If a motion under § 1.633(a) cannot be timely filed, a belated motion may be filed provided the moving party complies with the provisions of § 1.645(b). Whether or not a belated motion will be accepted where a public use or sale is discovered after the time for filing § 1.633(a) motions which has passed will manifestly depend on the facts of a given case.

One comment suggested that the language "speedy, and inexpensive" be deleted from the second sentence of the preamble of § 1.601. This suggestion is not being adopted. The second sentence of the preamble of § 1.601 provides that the rules "shall be construed to secure the just, speedy, and inexpensive determination of every interference." The provision is modeled in part after the second sentence of Rule 1 of the Federal Rules of Civil Procedure which states that the Federal Rules "shall be construed to secure the just, speedy, and inexpensive determination of every action." The "just, speedy, and inexpensive determination" provision of § 1.601 will prove useful in construing other provisions in the rules.

Two comments received which suggested a change in language in § 1.601(j). One comment correctly noted that "[i]f even one claim of each party defines the same patentable invention, there is an interference-in-fact." The comment went on to correctly note that "[t]he remaining claims can be disposed of by a motion under § 1.633(c)(4)." A second comment noted that under the definition proposed, all the claims of both parties corresponding to a count must define the same patentable invention. The comment went on to correctly note the intent of the PTO is, however, that an interference-in-fact exists if at least one of the claims of a party corresponding to a count defines the same patentable invention as one of the corresponding claims of an opponent. In view of the suggestions made in the two comments, § 1.601(j) has been changed to state that an interference-in-fact exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count defines the same patentable invention.

Two comments were received which suggested that the language "earliest filing date" in § 1.601(m) be changd to read "earliest effective filing date." The suggestion is not being adopted. Section 1.601(m) defines "senior party." The definition of "senior party" in § 1.601(m) is consistent with current practice and is intended to codify current practice. In an interference where there are no benefit applications, the "senior party" is the party with the earliest "filing date." There are interferences where a party may be "senior" with respect to a first count based on the filing dates of the applications involved in the interference and "junior" with respect to a second count because the opponent is entitled to benefit of an earlier application as to the second count only. Under these circumstances in the past, the PTO has designated the party who is "senior" based on the filing dates of the applications involved as the "senior party." The designation of the party as "senior party" is for procedural purposes only, i.e., setting who takes testimony first, and does not affect which party has the burden of proof. Section 1.601(m) preserves this past practice.

Comments were received regarding § 1.601(n) which defines "same patentable invention" and "separate patentable invention." One written comment suggested that § 1.601(n) be deleted. The commentator appeared at the hearing and also urged orally that § 1.601(n) be deleted. The suggestion is not being adopted. In view of the nature of the comment and the importance of the definitions in § 1.601(n), the written comment is reproduced in its entirety:

Comment: The paragraph to be deleted contains an explicit definition of both "same patentable invention" and "separate patentable invention". It requires application of a two-prong test for determining "sameness" or "separateness". Two inventions are considered to be the "same patentable invention" when they are the same under 35 U.S.C. 102 or obvious variants under 35 U.S.C. 103 when one is considered as "prior art" with respect to the other. Application of this standard may lead to results which are anomalous or in conflict with statutory requirements if, as the proposed rules apparently assume, the award of priority as to counts embodying "separate patentable inventions" will inherently and finally resolve the question of entitlement to a patent as between the parties on involved claims corresponding to those counts. Three specific problems with the definition of Rule 601(n) have been identified as follows:

(1) If the standard of separate patentability as between two counts is applied on a mutual basis (i.e., Invention A must be separately patentable from Invention B considered as prior art and Invention B must be separately patentable from Invention A considered as prior art), then the conduct of interferences with separate counts directed to both a generic invention and an included specific embodiment thereof (i.e., a species) are frustrated. If, however, such mutuality is not applied (i.e., if Invention A is the existing count, then a count directed to Invention B is proper so long as Invention B would be considered patentable over Invention A as prior art), then a number of irreconcilable anomalies in count modification through preliminary motions practice will be manifest.

(2) "Separate patentability" as a non-obviousness issue is in every context *except* interference practice before the PTO determined with finality only when an *affirmative* determination has been reached or the applicant *elects* to discontinue further prosecution of any applications embodying the invention or to admit obviousness. Because in the ex parte context an applicant may continue to marshal additional evidence supportive of non-obviousness until separate patentability over a prior art invention has been established, "separate patentability" is always a fluid concept where ultimate resolution can neither be predicted nor foreclosed. On certain cases interference proceedings under the proposed rules will be conducted and judgment rendered on the assumption of a lack of "separate patentability", which would ordinarily be subject to change or rebuttal as additional argument, evidence or other supportive activity of non-obviousness were marshalled. Thus, simply determining a proposed count is not yet "separately patentable" for the purposes of count formation ought not to foreclose post-interference reconsideration of separate patentability questions when the party proposing the count would not have been foreclosed on priority grounds.

(3) The underlying assumption that "separate patentability" is to be established under the proposed rules for one invention when a second invention is considered as "prior art" does not have any necessary correspondence to the *effect* of an adverse judgment in an interference on the question of priority. While a lost count in interference is not patentable to the loser, the lost count will be considered as "prior art" against the losing party only if the status of prior art for the purposes of 35 U.S.C. 103 is established by the record in the interference, (i.e., by representing a prior invention of another made in the United States, not abandoned, suppressed or concealed under 35 U.S.C. 102). A party entitled to priority for a count under the benefit provisions of 35 U.S.C. 119 creates no "prior art" under 35 U.S.C. 102(g)/103 against his opponent. Separate counts ought not to be created or denied in an interference on the basis of a rule which fails to account for whether the interference record will confirm the assumption in the definition that a lost count will become "prior art".

The following examples are provided as indicative of perceived difficulties in the application of the definition embodied in Rule 601(n):

Example A: Rule 601(n) is applied in a mutuality sense to an interference where the existing count (Invention A) is a broad genus over organic compounds. Both parties disclose a species (Invention B) which one of the parties alleges represents a "selection invention", i.e., is neither anticipated by the genus nor obvious therefrom. The party proposing to add a species count to Invention B must demonstrate that the genus was neither the same as nor obvious in view of the species, an impossibility since *disclosure of the species anticipates the genus under 35 U.S.C. 102.* In effect, no party could ever propose sub-generic or species counts included within broader generic counts. Since all potential patentability and priority questions with respect to possible sub-generic and species claims are intended to be resolved in the unified patentability/priority proceedings, loss of such a broad generic count might be construed as estopping the losing party from arguing entitlement to a patent for species and sub-genera within the lost count. Since proof of a single species is dispositive of the question of priority as to a genus, no matter how large, this is a more severe result than would appear to be proper or intended.

Example B: Under the facts of Example A, if the standard under which the propriety for including a second sub-generic or species count is merely that the *proposed* count must be non-obvious over the *existing* count considered as prior art, then, an interference could conceivably proceed with both the generic and the species count in the interference. The usual criteria for "selection inventions" could be employed. However, when an interference is declared with a species count embodying Invention A, then utilization of a test requiring that a proposed count be non-obvious over the existing count as prior art leads literally to the conclusion that a proposed count to a generic Invention B is *anticipated* by the existing species count and therefore may not be added to the interference. This artificial distinction can certainly not have been intended, and yet the rules provide no clear indication of which result is the "correct" one or whether another test will be employed, e.g., the narrower count need only be non-obvious over the broader count.

Example C: A party moves to substitute two sub-generic counts to allegedly separately patentable inventions, Inventions A and Invention B, in place of a broad generic count to the "Markush" group of Invention A *and* Invention B. The party alleges Invention B has surprising and unexpected properties over Invention A and is separately patentable thereover. Because, however, a consideration of Invention B as "prior art" suggests Invention A would not be non-obvious thereover the motion is denied. The moving party establishes priority as to Invention B, but loses the sole count of the interference to an opponent who filed a foreign application disclosing a single species from Invention A. The result is that the moving party with clear evidence of priority apparently loses the right to patent an invention on the technicality of "count formation" in interference. The result is substantially more severe than had he been simply faced with a statutory bar!

Example D: The senior party, a foreign applicant, relies on a priority application disclosing Embodiment A. Subsequently the junior party files a United States application directed to an Embodiment B. Thereafter both parties file applications in the United States disclosing a generic invention including both Embodiments A and B. An interference is declared on the generic invention and the junior party moves to substitute two counts, one count to Embodiment A and a second count to Embodiment B on the ground that they represent separate patentable inventions. Since the junior party's invention date for Embodiment B is after the senior party's priority date, the junior party will be obliged to concede priority on the sole count in the interference unless his motion to substitute counts is granted.

Accordingly, the junior party undertakes laboratory tests which indicate that both Embodiments A and B achieve substantially the same result in substantially the same manner without any significant differences in effectiveness. Without evidence of separate patentability to support the motion to substitute, the junior party is unsuccessful and priority is awarded to the senior party.

The junior party abandons his claim to the generic invention of the lost count, but persists in his assertion he is entitled to a patent on Embodiment B since the interference record indicates no actual priority for this embodiment in favor of the senior party. Ultimately, the junior party obtains evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting, while Embodiment A is substantially unsuitable for practical use in a commercial setting.

Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate patentability in an *inter partes* proceeding? If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? Finally, would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? All of these questions suggest that the utilization of a fluid concept such as non-obviousness as the basis for count formation will give unintended and unsupportable results in situations where the lack of separate patentability is prematurely assumed.

Example E: In the scenario of Example D, the non-entitlement to contest Embodiment B as a separate count was premised on a failure to demonstrate that Embodiment B was non-obvious over Embodiment A considered as prior art. However, an award of priority to the senior party based on the disclosure of Embodiment A in a foreign priority application does not render Embodiment A as available prior art (35 U.S.C. 102(g)/103) inasmuch as Embodiment A would not have been a prior invention of another made in the United States which had not been abandoned, suppressed or concealed. The junior party's entitlement to a patent on Embodiment B should depend, therefore, solely on his entitlement to priority with respect to Embodiment B. Priority is a necessary condition for entitlement to a patent since both parties disclose the embodiment and a sufficient condition since regardless of the party entitled to priority on Embodiment A, it should not become obviousness-generating prior art. Therefore, any standard or count formation which fails to reach the result of the junior party is entitled to contest priority and a patent on Embodiment B is contrary to current statutory requirements for entitlement to a patent.

The proposed rules attempt to rationally define counts in an interference so that the judgment in the interference settles all questions of entitlement to a patent. This not only cannot be done *prospectively*, but should not be done at all. Judgment should be made on *claims*, not counts and unpatentability determinations made against a party subject to the normal *ex parte* standard that additional evidence of non-obviousness, or other evidence or patentability wholly independent of priority itself, could compel a reconsideration of the judgment of unpatentability.

With respect to paragraph (1) of the comment, the standard of patentability will *not* be applied "on a mutual basis." Thus, if a species is patentable over a genus, the species is a "separate patentable invention" from the genus. Compare *In re Taub*, 348 F.2d 556, 146 USPQ 384 (CCPA 1965) (fluorine species might be patentable over genus of Markush group of hydrogen and halogen). A first count to a genus and a second count to a species which is patentable over the genus may properly appear in an interference. See e.g., Example 4. The comment suggests that if "such mutuality is not applied * * * then a number of irreconcilable anomalies * * * will be manifest." The urged "irreconcilable anomalies" are not readily apparent to the PTO.

The PTO disagrees with the concept expressed in paragraph (2) of the comment that there should be "post-interference reconsideration of separate patentability." One of the principal objects of Pub. L. 98-622 and these new rules is to encourage complete determination of all rights between parties in an interference and to avoid post-interference reconsideration in an *ex parte* environment of issues which were or could have been raised *inter partes* in an interference.

The commentator remarks in paragraph (3) of the comment that "[a] party entitled to priority for a count under the benefit of 35 U.S.C. 119 creates no 'prior art' under 35 U.S.C. 102(g)/103 against his opponent. *In re*

McKellin, 529 F.2d 1324, 188 USPQ 428 (CCPA 1976), arguable provides support for the commentator's remark. It should be noted, however, that in defining "same patentable invention" and "separate patentable invention" in § 1.601(n), the PTO is not establishing a new definition of "prior art." Rather, the PTO is providing defintions which will determine—both initially and ultimately in an interference—how *claims* in an application or patent will be designated to correspond to counts. See §§ 1.603 and 1.606. Examples 1–19 illustrate how the PTO proposes to initially designate claims to correspond to counts. The designation of claims to correspond (or not correspond) to a count is significant because, as noted by the plurality opinion in *McKellin*, 529 F.2d at 1327, 188 USPQ at 432: "[a]n applicant [or patentee] who has lost an interference is not entitled to claims which correspond to the subject matter of the counts, of the interference." Section 1.658(c) estops a party from obtaining a claim which could have been added and which would have been designated to correspond to the lost count. The definitions of "same patentable invention" and "separate patentable invention" in § 1.601(n), the availability of motions to designate or not designate claims as corresponding to a count under § 1.633(c), and the estoppel provisions of § 1.658(c) provide the basis for accomplishing the PTO's objective of resolving *inter partes* in a single proceeding all issues which are or could have been raised between parties in an interference.

Examples illustrate how §§ 1.601(n), 1.633(c) and 1.658(c) accomplish the PTO's objective.

Example 32. Application AV discloses engines in general and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). The U.S. "filing date" (§ 1.601(h)) of the AV application is prior to the U.S. filing date of the AW application, but the AW application claims a foreign priority date under 35 U.S.C. 119 based on an application filed in a foreign country prior to the filing date of the AV application. An interference is declared. The sole count of the interference is to "an engine." Claim 1 of the AV application and claim 3 of the AW application are designated to correspond to the count. During the interference, applicant AV does not move under § 1.633(c)(2) to add a claim to a 6-cylinder engine and to designate the claim to correspond to the count. Applicant AW is awarded a judgment in the interference based on the earlier filing date of the foreign patent application. After the interference, applicant AW adds claim 2 (6-cylinder engine) to the AV application. Whether AV would be entitled to a patent containing a claim to a 6-cylinder engine will depend solely on whether a 6-cylinder engine is a "separate patentable invention" from "engine"—the subject matter of the count. If a 6-cylinder engine is a "separate patentable invention" within the meaning of § 1.601(n), applicant AV could not have successfully moved under § 1.633(c)(2) to add claim 2 and to designate it to correspond to the count. Therefore applicant AV could obtain a patent containing claim 2. If, on the other hand, a 6-cylinder engine is not a "separate patentable invention," claim 2 of the AV application would be rejected on the basis of interference estoppel because claim 2 could have been added by a motion under § 1.633(c)(2). See § 1.658(c). See also Example 37.

Example 33. This example is basically the same as Example 32, except that application AV initially contains claim 1 (engine) and claim 2 (6-cylinder engine). When the interference is declared, both claims 1 and 2 of application AV are designated to correspond to the count. During the interference, applicant AV does not move under § 1.633(c)(4) to designate claim 2 as not corresponding to the count. A judgment in the interference is entered for applicant AW based on the earlier filing date of the foreign patent application. After the interference, applicant AV would not be able to obtain a patent containing claim 2, because that claim was designated to correspond to a count and entry of the judgment constitutes a final decision by the PTO refusing to grant applicant AV a patent containing claim 2.

In the written comment, Examples A through E were set out to illustrate what the commentator believed were "perceived difficulties." These examples are set out above and are analyzed below.

Analysis of Commentator's Example A. Example A does not describe any practice under these rules, because "same patentable invention" and "separate patentable invention" under § 1.601(n) are not intended to be "applied in a mutuality sense." Where a first count is to a genus and a second count is to a species within the scope of the genus, there may be two counts if the species is separately patentable from the genus. The species is "invention A" referred to in § 1.601(n); the genus is "invention B" referred to in § 1.601(n).

Analysis of Commentator's Example B. Commentator's Example B suggests—incorrectly—that if an interference is declared with a count to a species that no motion under § 1.633(c)(1) to add a count to a genus can ever be granted. If the species ("invention A" referred to in § 1.601(n)) is not anticipated by or obvious in view of the genus ("invention B" referred to in § 1.601(n)), a motion to add a separate count to the genus may be proper. The commentator uses the language "selection inventions" in both Examples A and B. Insofar as the PTO is aware, the language is not a term of art in the patent law. The PTO has not ascribed any particular meaning to the language in analyzing Examples A or B.

Analysis of Commentator's Example C. The result suggested in commentator's Example C can come to pass only if the moving party accepts as final the denial of the motion to substitute two "sub-generic counts" for the "broad generic count." Unlike practice under the rules which have been in effect, under these new rules a decision denying a motion to substitute a count is reviewable by the Board (see § 1.640(c) and § 1.655(a), second sentence). Additionally, the party could seek judicial review (35 U.S.C. 141, 146) of any final decision by the Board. However, if the party accepts as final the PTO's determination that inventions A and B are the "same patentable invention," the party would be precluded from obtaining a patent to invention B. After the interference is terminated, the only conceivable way that the moving party could seek to obtain a patent containing claims to invention B would be to first successfully move to reopen the interference for the purpose of presenting additional evidence. If the motion to reopen is granted (and it would be expected that such a motion will rarely be granted), the moving party would then have to successfully establish that invention A and invention B are not the same patentable invention. The PTO will continue to follow the general guidelines of 4 Rivise & Caesar, *Interference Law and Practice*, section 821 *et seq.* (Michie Co. 1948), in determining motions to reopen an interference after entry of judgment. It should be additionally noted that interferences in which a judgment has been entered by a district court in an action brought under 35 U.S.C. 146 or a mandate has been entered by the U.S. Court of Appeals for the Federal Circuit (35 U.S.C. 141 or 28 U.S.C. 1295(a)(4)(C)) will not be reopened until the district

court vacates its judgment and/or the Federal Circuit withdraws its mandate.

Analysis of Commentator's Example D. Several questions asked in the commentator's Example D can be answered as follows:

Question: Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate patentability in an *inter partes* proceeding? *Answer:* No. The junior party should have presented the "evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting" during the interference. The PTO expects to resolve issues *inter partes* in the interference. If the PTO was to permit the evidence to be presented after the interference is terminated and after *ex parte* prosecution resumes, a principal purpose of the overall change to interference practice would be defeated. It may be unfortunate that the evidence was not known to the junior party. However, it may also be true that the winning party—had the evidence been presented in the interference—could have produced probative counter-evidence. Why should the winning party be put to the expense of a second interference?

Question: If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? *Answer:* The premise in the question is not correct. The junior party is not entitled to a patent to Embodiment B and therefore there will not be a second interference.

Question: Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? *Answer:* Yes, unless the junior party can successfully move to reopen the interference.

Question: Would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? *Answer:* While the question is not fully understood, it should be recognized that counts will initially be formed when an interference is declared and are subject to being changed by a motion (§ 1.633(c)) or by the Board (§ 1.640(c) and § 1.655, second sentence). The correctness of the PTO's ultimate decision on what counts should be is subject to judicial review (35 U.S.C. 141, 146).

Analysis of Commentator's Example E. The PTO, without agreeing or disagreeing with all of the commentator's statements in Example E, disagrees with any ultimate conclusion that the junior party is entitled to a patent on Embodiment B and that such a result "is contrary to current statutory requirements for entitlement to a patent." Interference estoppel precludes granting a patent claiming Embodiment B to the junior party even if Embodiment A is not prior art with respect to Embodiment B.

One comment asked whether "invention A" and "invention B" mentioned in § 1.601(n) "refer to the entire scope of subject matter recited in a claim or to the disclosed embodiment(s) supporting the claim (a la *In re Vogel*, [422 F.2d 438,] 164 USPQ 619 (CCPA 1970))?" The question is somewhat difficult, if not impossible, to answer in the abstract. Whether "invention A" refers to the entire scope or to the embodiments which support a claim is not controlling under these new rules. One fundamental change being made unde the new rules is that judgments will be in the form of whether an applicant or patentee is or is not entitled to a *claim*. In the past, the Board of Patent Interferences has entered an "award of priority." The use of an "award of priority" does not always accurately express the "judgment" entered in many interferences. See e.g., *Applegate* v. *Scherer*, 332 F.2d 571, 573 n. 1, 141 USPQ 796, 798 n. 1 (CCPA 1964). Whether an applicant or patentee is or is not entitled to a particular claim in any given interference will depend on many factors, some of which include the scope of the claim, the scope of the opponent's claim, and the prior art. An example illustrates the point.

Example 34. Applicant AX discloses an apparatus having fastening means. The specific means disclosed are rivets. Applicant AY discloses a similar apparatus having fastening means. The specific means disclosed are a nut and bolt. The prior art reveals that items have been fastened with numerous fastening means including both rivets and nuts and bolts. In determining whether AX's apparatus with rivet fastening means is the "same patentable invention" as AY's apparatus with nut and bolt fastening means, it would be proper to consider the specific apparatus disclosed by AX, the specific apparatus disclosed by AY, the fact that both AX and AY disclose the use of "fastening means" broadly, and the prior art which shows rivets and nuts and bolts to be known fastening means.

One comment suggested that the last sentence of § 1.604(b) and the last sentence of §1.607(c) be deleted in view of a proposed rule (§10.23(c)(7); 49 FR 10028; 49 FR 33809) which defines "misconduct" as including "[k]nowingly withholding from the Office information identifying a patent or application of another from which one or more claims have been copied." The proposed rule is still being considered. In any event, the last sentences of §§ 1.604(b) and 1.607(c) are instructions to examiners whereas proposed 37 CFR 10.23(c)(7) defines misconduct for those registered to practice before the PTO. Another comment suggested deletion of § 1.604(b) because "existing rules [37 CFR 1.56] already provide a duty of disclosure of subject matter *material* to examination." There is no inconsistency between the rule relating to the duty of disclosure and § 1.604. The comment also suggested that by identifying another application, an applicant "might be construed as having *admitted* that the claims" of the other application are directed to the same patentable invention as the claims in the applicant's application. The filing of such a paper is a statement by the applicant that the claims presented are "*known* to the applicant to define the same patentable invention" (emphasis added). If an applicant wishes to call another application to the attention of an examiner and the applicant believes that the other application does *not* claim the same patentable invention, but nevertheless may be relevant within the meaning of 37 CFR 1.56, the applicant may identify the other applications and at the same time state why the invention claimed in the other application is not the same patentable invention as the invention claimed in the applicant's application. For the reasons given, the suggestions made in the two comments are not being adopted.

Three comments relating to § 1.605 were received. One comment suggested that the language "or substantially the same as the suggested claim" be deleted from the third sentence of §1.605. The suggestion is being adopted to the extent that the language "a claim which is the same or substantially the same as" is being deleted. Under § 1.605, when the examiner requests an applicant to copy a suggested claim, the applicant will be required to copy verbatim the claim suggested by the examiner. A second comment suggested that the second and third sentences of § 1.605 be changed to read as follows:

> The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim, or shall identify in the application one or more pending claims which the applicant regards as being directed to the same or substantially the same invention as the suggested claim, within a time specified by the Examiner, not

less than thirty days. Failure or refusal of an applicant to timely present a claim or to timely identify one or more claims which are directed to the same or substantially the same invention as the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim.

A third comment suggested that the second and third sentences of §1.605 fail to take into account the case where an applicant is already claiming the invention. The third comment suggested addition of the following at the end of the third sentence of § 1.605(a): ", unless the application already contains claims to the same patentable invention." The suggestions made in the second and third comments are not being adopted as such. However, the following sentence is being added as the fourth sentence of §1.605: "At the time the suggested claim is presented, the applicant may also: (1) Call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." A major deficiency of the suggestions made in the second and third comments was the inability of the PTO to efficiently and effectively handle situations where the applicant: (1) Presents a claim which is "substantially the same as" the suggested claim or (2) points to a claim already in the application *and* the examiner is of the opinion that the claim is not to the same patentable invention. Under those circumstances, the examiner could not properly declare an interference. Accordingly, the applicant will be required to present verbatim the suggested claim. The applicant may, however, also present any other claim which the applicant believes is more appropriate. Alternatively, the applicant, in addition to presenting verbatim the suggested claim, may also call the examiner's attention to a claim already in the application which the applicant believes is more appropriate for interference purposes. In either case, the applicant must explain to the examiner why a claim other than the suggested claim is more appropriate for inclusion in the interference. Upon consideration of the suggested claim and the applicant's alternative claims and any explanation, the examiner is in a position to forward the application to the Board for declaration of an interference. If the applicant is dissatisfied with the claims of the application designated to correspond to the count, the applicant may file an appropriate motion under §1.633(c).

Two comments were received which suggested that the last sentence of § 1.606 is not entirely clear. One comment suggested that the language in the last sentence which reads: "to define one patentable invention" be changed to read: "not to contain separate patentable invention." This suggestion is being adopted. The use of the language "*one* patentable invention" was unfortunate and rendered the actual intent of the rule unclear. Under § 1.606, at the time an interference is declared a *rebuttable* presumption will exist that any patent claim designated to correspond to a count does not embrace separate patentable inventions. Moreover, at the time the interference is declared, no count will be narrower in scope than the broadest patent claim designated to correspond to that count. The presumption is *rebuttable* and may be challenged and overcome by a motion under § 1.633(c). Examples 17 and 18 illustrate practice under § 1.606.

Two comments were received discussing § 1.607. A first comment suggested that the word "must" in the first sentence of § 1.607(c) be changed to "shall". The suggestion is being adopted. Use of "shall" makes § 1.607(c) consistent with § 1.604(b). A second comment asked the following question:

> If the examiner determines that the applicant's claim is patentable but that there is no interfering subject matter, and the examiner accordingly allows the claim but refuses to declare an interference, is that determination appealable [to the Board of Appeals and Interferences under 35 U.S.C. 1.134]?

The commentator suggests that "such a determination" is appealable and rationale in support of the commentator's position appears in Gholz, *Board of Appeals Jurisdiction Over Appeals from Decisions by Primary Examiners Refusing to Institute Interferences on Modified or Phantom Counts*, 64 J. Pat. Off. Soc'y 651 (1982). At the hearing, the commentator orally urged that the rules be amended to permit an appeal to the Board when an examiner allows a claim, but refuses to declare an interference involving the allowed claim. The suggestion is not being adopted. A decision by an examiner to allow a claim, but not to declare an interference involving the allowed claim, is petitionable and not appealable. See Gholz, *supra*, at 652 n.13. The rule being suggested would enlarge the jurisdiction of the Board. Action by Congress would be necessary to accomplish what is embodied in the suggestion.

Several written comments and one oral presentation at the hearing were made concerning § 1.608. One comment suggested that § 1.608 be expanded to provide for summary judgment in interferences involving applications where the earlier of the filing date or effective filing date of one application was three months earlier than the date of the other application. This suggestion is not being adopted. Ordinarily, interferences are not declared between applications having effective dates more than three months apart. Moreover, expanding summary judgment proceedings to application-application interferences would result in delay in resolving interferences. Currently in application-patent summary judgment proceedings under 37 CFR 1.204(c), very few summary judgments are entered against applicants who are junior to a patentee by more than three months. There is no reason to expect that a significant number of summary judgments would be entered in application-application interferences. As noted in the notice of proposed rulemaking, the PTO has already declined to expand summary judgment proceedings to cases where a patentee is junior to an applicant by more than three months. See 49 FR 3775 (paragraph bridging columns 1 and 2); 1039 O.G. 34; 1039 TMOG 34; 27 BNA 319.

Two written comments were received which suggested that § 1.608(b) should be more specific in indicating the kind of evidence which should be submitted when an applicant attempts to make out a *prima facie* case based on priority of invention. The suggestions in the comments are being adopted. The following sentence has been added to § 1.608(b):

> Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent.

Similar language appears in the current rule: 37 CFR 1.204(c). The PTO agrees entirely with the following discussion made by one commentator:

> The material added to Rule 608(b) currently appears in existing 37 CFR 1.204(c). A comparison of the existing language of 37 CFR 1.204(c) with the proposed rule might be construed as suggesting that the allegations which are now expressly required where priority is an issue will be changed, specifically relaxed in some manner. Since under proposed Rule 617 this clearly is *not*

the case, the proposed addition to Rule 608(b) should assist the practitioner in understanding the intent of the PTO.

The commentator has accurately pointed out that the PTO intends to apply a stricter standard for filing additional evidence in summary judgment proceedings after an order to show cause has been issued. See the notice of proposed rulemaking, 49 FR 3775 (column 1); 1039 O.G. 34; 1039 TMOG 1039; 27 BNA 319 (column 1).

At the hearing, it was suggested that § 1.608 should encourage the use of 8½ by 11 inch paper for affidavits. This suggestion is being adopted and the following sentence has been added to § 1.608(b): "To facilitate preparation of a record (§ 1.653 (g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8½ × 11 inches (21.8 by 27.9 cm.)." The commentator at the hearing suggested that "many people submitting a Rule 608(b) showing are going to want to rely upon that showing under Rule 672(b)" in those cases where an interference is allowed to proceed. Use of 8½ by 11 inch paper will facilitate preparation of the ultimate record.

Two comments were received with respect to § 1.609. The first comment suggested that the language "count or counts" in § 1.609(b)(1) be changed to "proposed count or counts" and that each occurrence of "the count" in § 1.609(b)(2) be changed to "each count". The suggestion is being adopted. These changes are editorial in nature and are designed to enhance the clarity of the rule. A second comment indicated that it was not clear to the commentator why it was necessary under § 1.609(b)(3) for the examiner to identify the claims in an application or patent which are deemed to be patentable over any count. The commentator went on to say that the examiner "could probably readily identify claims which would clearly be unpatentable over a count and perhaps this would be all that is needed. If the examiner simply said all claims are considered unpatentable over the count, what recourse does the applicant have if he disagrees?" The purpose of having the examiner identify all claims which are patentable over the count or counts is to place the parties on notice that those claims are allowable notwithstanding any decision in the interference. Thus, in an interference between Jones and Smith if the examiner indicates that claim 8 of Jones is patentable over the proposed count or counts, Smith will know that Jones may receive a patent containing claim 8 even if Smith wins the interference. This will permit Smith to move under § 1.633(c) to add claim 8 as corresponding to a count if Smith believes claim 8 defines the same patentable invention as one of the counts. Contrary to the suggestion in the comment, an examiner will not indicate that a claim is unpatentable over a count; rather, the examiner will designate the claim to correspond to a count. Each claim in a patent or application which is directed to the same patentable invention as a count will be designated to correspond to the count. Under the new practice, an examiner will no longer have occasion to indicate that a claim will be rejected over a lost count. To fully answer the commentator's question, if a claim is designated to correspond to a count and the applicant believes the claim does not define the same patentable invention as the count, the applicant may move under § 1.633(c) to designate the claim as *not* corresponding to the count. If the motion is granted, the examiner would be authorized to issue the applicant a patent containing the claim even if the applicant loses the interference.

Several comments were received which discuss § 1.611. One comment suggested addition of a paragraph (f) to permit expanded summary judgment proceedings in application-application interferences. Since expanded summary judgment proceedings are not contemplated, the suggestion is not being adopted. See the discussion above under analysis of comments of § 1.608(b). Two comments suggested that § 1.611(c)(8), which provides that a notice declaring the interference shall specify among other things the "order of the parties," fails to take into account the fact one party may be "senior" as to one count and "junior" as to another count. As explained above in connection with the analysis of the comments concerning §1.601(m), the "order of the parties" is a procedural tool. It indicates the "style" of the case—which practitioners are encouraged to use. It there are two counts and one party is "senior" as to one count and "junior" as to another count, the party has the burden of proof as to that count to which the party is "junior." See § 1.657. Appropriate testimony periods will be set (§ 1.651(b)) to accommodate differing burdens of proof in cases where a party is "senior" on one count and "junior" on another count. The suggestions to change the meaning of "order of the parties" are not being adopted. Another comment suggested that §1.611(e) be changed to indicate that notice "shall" (as opposed to "may") be given in the *Official Gazette* when an interference has been declared involving a patent. No useful purpose would be served by changing "may" to "shall" inasmuch as the rights of parties involved in an interference are not affected by publication or non-publication of the fact that a patent is involved in the interference. By § 1.611 the PTO intends to exercise discretion to publish in the *Official Gazette* an identification of patents which become involved in interferences; however, the PTO does not intend to undertake an absolute obligation to do so. The use of "may" better expresses the PTO's intent behind § 1.611(e).

No written comments were received relating to § 1.612. However, at the hearing two suggestions were made orally. The first suggestion was that where a "party" has obtained a copy of his "opponent's affidavit under § 1.131 or § 1.608(b) (see § 1.612(b)), the party should be required to notify the opponent. According to the suggestion, if the opponent then intends to rely on the affidavit (§ 1.671(e)), the opponent would have to "re-serve" the affidavit on the party. This suggestion is not being adopted. When the party gains access to the affidavit under § 1.612(b), the party may or may not make an accurate copy. On the other hand, the opponent knows exactly those portions of the affidavit upon which the opponent intends to rely. After careful consideration, the PTO believes on balance that it is better for the opponent to serve a copy of the evidence upon which the opponent intends to rely. Service avoids issues as to whether the party obtained under § 1.612(b) a complete and/or accurate copy of the evidence upon which the opponent intends to rely.

The second suggestion concerning § 1.612 made orally at the hearing was that a party should have access to an opponent's "predecessor application, even though the application may not be relied upon for 35 U.S.C. 120 benefit." According to the suggestion, access to a "predecessor application" may be needed to uncover relevant evidence, including violations of 37 CFR 1.56. Specifically, the commentator called attention to *Driscoll* v. *Cebalo*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984), *rehearing denied mem.* (Fed. Cir. July 25, 1984). The suggestion is not being adopted. The Patent Statute (35 U.S.C. 122) provides that applications for patent will be preserved in secrecy by the PTO unless special circumstances are shown. Section 1.687(c) provides for "additional discovery" when required in the interest of justice. Additional discovery is believed to provide the necessary procedural vehicle for

obtaining access to an opponent's "predecessor application."

One comment was received which suggested that the language "or members of the same firm of attorneys and agents" be added after "agent" in §1.613(b). The suggestion is being adopted because it is believed to make the rule clearer.

One comment was received which said the following with respect to § 1.616: "Sanctions should not be left to the Examiner-in-Chief (EIC) or BAI [Board of Patent Appeals and Interferences]—This Rule is *unnecessary* and should be deleted. An alternative would be to give sanction power only to the BAI." The suggestion to delete § 1.616 is not being adopted. There are cases where sanctions are warranted. See e.g., *Woods* v. *Tsuchiya*, 207 USPQ 228 (Comm'r. Pat. 1979) and *Tezel* v. *Bellantoni*, 188 USPQ 688 (Bd.Pat.Int. 1975). The PTO continues to believe that imposition of a sanction (except judgment) by a single examiner-in-chief is appropriate. In any event, a party may ask a 3-member panel of the Board to reconsider any sanction which may be imposed by a single examiner-in-chief. See § 1.640(c).

Several written and oral comments were received regarding § 1.617.

One oral comment made at the hearing suggested that "it should be explicitly stated in Rule 617(a) that the decision of the examiner-in-chief to permit the interference to proceed is without prejudice to the right of any other party to attack the sufficiency of the Rule 608(b) showing when offered as Rule 672 testimony." The suggestion is not being adopted. While no explicit statement to that effect will be placed in § 1.617(a), it necessarily follows that any opponent may attack the sufficiency of an applicant's showing under § 1.608(b) when that showing is presented as evidence under § 1.672. In summary judgment proceedings, all an applicant need do is make out a *prima facie* case. If the interference is allowed to proceed in the normal manner, the applicant must prove priority by a preponderance of evidence (when the application and the patent are copending) or beyond a reasonable doubt (when the application was filed after the patent issued). Manifestly, the burden in summary judgment proceedings is not as strict as the burden in proceedings following summary judgment. *Breuer* v. *DeMarinis*, 558 F.2d 22, 28, 194 USPQ 308, 313 (CCPA 1977) and *Schwab* v. *Pittman*, 451 F.2d 637, 640, 172 USPQ 69, 71 (CCPA 1971).

Several comments suggested that an applicant should be permitted as a matter of right to file a reply to any statement filed by any opponent under § 1.617(d). The suggestion that a reply be permitted is being adopted. Accordingly, § 1.617(e) has been changed to read: "[w]ithin a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." Some of the comments indicated that the applicant should be able to reply to a statement by a patentee or another opponent. The language "any opponent" in § 1.617(e) is intended to include both the patentee and any other opponent. The change in the last sentence of § 1.617(h) of "patentee" to "any opponent" is intended to make clear that all parties may appear at a hearing if the applicant requests a hearing.

One comment suggested that the patentee (and presumably any other opponent) should be allowed to present "evidence" during summary judgment proceedings. This suggestion is not being adopted. A change in the second sentence of § 1.617(d) is intended to make clear that opponents may file statements in response to an applicant's "response," but the statement "shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." The PTO does not intend to expand summary judgment proceedings into a "mini-interference." An applicant presents evidence under § 1.608(b). If the examiner-in-chief finds that evidence insufficient, an order to show cause stating reasons for the insufficiency is issued. An applicant may respond and, if appropriate, file "additional evidence." The PTO intends to be rather strict in permitting the filing of new evidence. After the applicant responds (with or without additional evidence), any opponent may file a statement. In the statement, the opponent should be free to comment on all the evidence (original and additional) which the applicant presents. Compare *In re Plockinger*, 461 F.2d 1327, 179 USPQ 103 (CCPA 1973). Under § 1.617(d) the opponent may not urge a rationale for summary judgment which does not appear in the order to show cause issued by the examiner-in-chief. However, it is not the PTO's intent to interpret § 1.617(d) in the narrow manner the Court of Customs and Patent Appeals interpreted 37 CFR 1.204(c) in *Kahl* v. *Scoville*, 609 F.2d 991, 995–996, 203 USPQ 852, 856 [headnote 6] (CCPA 1979). An example will illustrate how the PTO intends to interpret § 1.617(d).

Example 35. An applicant copies claims from a patent and is required to submit a showing under § 1.608(b). Upon review of the showing under § 1.608(b), the examiner-in-chief concludes that the showing fails to make out a *prima facie* case of priority, because applicant has failed to show an actual reduction to practice. Applicant files a response and includes additional evidence which purports to show an actual reduction to practice. The patentee then files a statement in which two arguments are made. *First*, patentee argues that the additional evidence has not been properly authenticated. *Second*, patentee argues that even if applicant has shown an actual reduction to practice, summary judgment is nevertheless appropriate because applicant suppressed and concealed after the actual reduction to practice. The first argument is proper, but the second argument is not. A patentee may comment on the sufficiency of the applicant's evidence. Fairness, however, dictates that summary judgment be granted only after fair notice in the order to show cause. Accordingly, summary judgment will not be based on a rationale raised by a patentee in a statement which does not correspond to the rationale used by the examiner-in-chief in the order to show cause.

A change has been made in § 1.617(a) and § 1.617(g) to make clear that once summary judgment proceedings have concluded, an interference will proceed "in the normal manner." The change is intended to codify the decisions in *Walsh* v. *Sakai*, 167 USPQ 405 (Comm'r. Pat. 1967) and *Ing* v. *Chiou*, 207 USPQ 321 (Comm'r. Pat. 1979). This change is further discussed in the discussion of the comments received with respect to § 1.635.

One comment was received which indicated that § 1.618:

> needs qualification. It may be appropriate to resubmit certain papers (See also 1.644(d) last sentence).

The precise "qualification" needed was not set forth in the comment. Likewise, no example of "certain papers" was set forth. Under the circumstances, the PTO declines to make any change in § 1.618.

Several comments were received which discussed the rules relating to preliminary statements.

Three comments were received which suggested that § 1.622(a) be amended to "take into account several court decisions holding that joint inventors need not be joint inventors of [the subject matter of] all claims." Changes have been made in § 1.622(a) consistent with the amendment to 35 U.S.C. 116 made by Pub. L. 98–622.

One comment was critical of §§ 1.623(c); 1.624(c); and 1.625(c), because § 1.628(b) does not cover the

possibility that a drawing might not be available, e.g., a drawing destroyed in "a fire." Section 1.628(b) has been amended to permit a party to allege a date when a first drawing or first written description was made in those circumstances where the first drawing or first written description is not available. The party will be required: (1) To show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party would also be required to file a motion to amend its preliminary statement promptly after the drawing or written description becomes available. It is the PTO's intent by the amendment § 1.628(b) to overrule the holding of headnote [1] of *Reddy* v. *Davis*, 187 USPQ 386, 388 (Comm'r.Pat. 1975).

Another comment was critical of the language "conceived" in § 1.623(a)(4). The current rules do not require a party to allege a conception; rather, they require one to allege the date of the certain acts which, if proved, would establish conception. See 37 CFR 1.216(a)(4). According to the commentator, an allegation of conception is "unprovable and meaningless." The use of "conception" in § 1.623(a)(4) is intentional and is designed to permit a party to "plead" the earliest date on which it believes conception occurred. Contrary to the suggestion in the comment, "conception" is not meaningless and may be proved during the testimony period. See *Gould* v. *Schawlow*, 363 F.2d 908, 150 USPQ 634 (CCPA 1966); *Meitzner* v. *Corte*, 410 F.2d 433, 161 USPQ 599 (CCPA 1969); and *Mergenthaler* v. *Scudder*, 11 App.D.C. 264, 1897 C.D. 724 (D.C.Cir. 1897). There is no need to prove "conception" in the preliminary statement.

A preliminary statement serves several useful purposes in an interference: (1) It serves to limit a party's proofs as to time, (2) it serves as a vehicle for permitting the examiner-in-chief or the Board to issue orders to show cause in those cases where it would be futile to take testimony, and (3) it serves as notice to an opponent of the case which is alleged by a party. Under the rules being announced herein, the issues which will be raised and decided by the Board at final hearing are made known during the interlocutory stage through: (a) The preliminary statement, (b) motions under § 1.633 and decisions thereon, and (c) notices under § 1.632 of a party's intent to argue abandonment, suppression, or concealment. Section 1.632(a)(4) requires a party to allege a date of conception—it does not require proof of conception. The allegation puts the opponent on notice that the party intends to prove conception as of a date no earlier than the date alleged in the preliminary statement.

One comment suggested that the rules relating to preliminary statements are deficient because they do not permit one to allege allegations concerning tapes. Specifically, the commentator said: "What about a taped transcript of an invention, a practice being followed in a number of research departments of corporations?" If making a tape is the last act of conception, a party may allege the date the tape was made as the conception date under § 1.623(a)(4).

Several comments were received which suggested that a party should not have to allege derivation in a preliminary statement because the party may not know derivation occurred until the testimony period. Section 1.625 requires a party to file a preliminary statement when derivation is an issue. If derivation is not known or discovered prior to the date the preliminary statement is due, a party may move to amend the preliminary statement and allege derivation promptly after existence of derivation is discovered.

Several comments discussing § 1.624 were received. One comment suggested that § 1.624.(a)(5) should require a party to state, where appropriate, that no actual reduction to practice of an invention made in a foreign country was introduced into the United States. This suggestion is being adopted and a second sentence has been added to § 1.624(a)(5) which provides: "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." This sentence conforms § 1.624(a)(5) to the allegation required in the second sentence of § 1.623(a)(5). Another comment suggested that the language "in the United States" be inserted after "reasonable diligence" in § 1.624(a)(6) and that all occurrences of the language "was made" in § 1.624(c) be changed to "was introduced into the United States". This suggestion is being adopted. As noted in the comment, "[t]he changes . . . are necessary to clarify that for an invention made abroad the only relevant activities are those which occur in the United States." See 35 U.S.C. 104.

One comment asked "how does one introduce 'an actual reduction to practice of the invention' in the United States?" *Breuer* v. *DeMarinis*, 558 F2d 22, 194 USPQ 308 (CCPA 1971), illustrates a case where an actual reduction to practice abroad was introduced into the United States.

One comment suggested that § 1.627(a) be changed to require preliminary statements "be enclosed in an outer envelope addressed to the Commissioner of Patents and Trademarks and be additionally marked Box Interference—Preliminary Statement." According to the comment, the confidentiality of preliminary statements "envisioned under the proposed rules would be further enhanced. . . ." The suggestion is not being adopted. The PTO believes it is sufficient if preliminary statements are enclosed in a sealed envelope as specified in § 1.627(a). The Board will not permit access to preliminary statements which have not been ordered opened by an examiner-in-chief.

Several comments discussing § 1.629 were received. One comment suggested that the first sentence ("A preliminary statement should be carefully prepared.") should not appear in § 1.629(a). This suggestion is being adopted. The PTO agrees with the commentator that the sentence:

> no longer appears necessary or appropriate in the context of rulemaking. The remainder of the paragraph makes the admonition redundant at best.

Two comments were received which suggested that the word "normally" be deleted from the last sentence of § 1.629(d). The suggestions are not being adopted. A preliminary statement is a pleading. The Board does not evaluate or consider the content of a drawing or written description prior to final hearing. At final hearing, in fact, the Board will only consider the drawing or written description if a party places the drawing or written description in evidence. The word "normally" first appeared in 37 CFR 1.223(c), last sentence, in 1978 (see e.g., 973 TMOG 19 (August 1, 1978)). The last sentence of 37 CFR 1.223(c) was intended to codify headnote [2] of *Reddy* v. *Davis*, 187 USPQ 386 (Comm'r. Pat. 1975). The word "normally" appears in the rule to permit the Board to exercise discretion to evaluate or consider the content of a drawing or written description in some unusual and presently unforeseen circumstance.

One comment suggested that "no earlier than" in § 1.629(b) be changed to "as early as". The suggestion is being adopted inasmuch as it is believed to more clearly state the intent of the rule.

One comment suggested that § 1.629(d) "is improper because it fails to

take into account testimony which can show that a drawing and/or written description were actually made even though the drawing and/or written description are not now available." A change to § 1.628(d) and addition of "unless the party complies with § 1.628(b)" to the first sentence of § 1.629(d) eliminates the problem raised by the commentator.

One comment discussing § 1.631(a) was received which expressed the view that a junior party should be required to send a copy of its preliminary statement to the senior party even if the senior party does not file a preliminary statement. According to the commentator, the senior party is *prima facie* the first inventor and at some time it will have to know the earliest dates alleged by the junior party. The rules require all parties to file a preliminary statement. If a junior party does not file a preliminary statement, it will be denied access to any other preliminary statement which is filed. A senior party, however, is always entitled to access to any preliminary statement filed by a junior party. See e.g., § 1.631(b). However, a junior party will only be required to serve a senior party who files a statement.

Numerous comments were received discussing § 1.633.

One commentator asked: "What sort of a judgment is in order if a count is not patentable over the prior art to an opponent?" Section 1.633(a) authorizes a party to bring a motion for judgment on the ground that the opponent's *claim* corresponding to a count is not patentable. It is important to note that the motion raises the patentability of the opponent's *claim* not the count. Accordingly, by a motion under § 1.633(a), a party seeks entry of a judgment that the opponent is not entitled to a patent containing a claim corresponding to a count.

Two comments questioned the nature of the judgment when a motion under § 1.633(b) is granted. Section 1.633(b) authorizes the filing of a motion for judgment on the ground that there is no interference-in-fact. If a motion under § 1.633(b) is granted, the judgment would provide that each party is entitled to a patent containing that party's claims corresponding to the count. Judgments in interferences under these rules will determine a party's entitlement or lack of entitlement to *claims* corresponding to a count.

One comment expressed the hope that "third party inventorship" would not be made an issue in interferences. Contrary to the hope expressed by the commentator, "third party inventorship" can be made the subject of a motion under § 1.633(a). Any ground of unpatentability may be made the subject of a motion under § 1.633(a) except: (1) Priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. It should be noted that under past practice, third party inventorship has not been considered "ancillary" to priority. *Sheffner* v. *Gallo*, 515 F.2d 1169, 185 USPQ 726 (CCPA 1975). However, under these rules, the question of whether an issue is "ancillary" no longer arises. See 130 Cong. Rec. H10528 (daily ed. Oct. 1, 1984) (statement by Rep. Kastenmeier). Pub. L. 98-622 gives the Board authority to consider priority and *patentability*. Third party inventorship involves a question of patentability. 35 U.S.C. 102(f).

One comment pointed out that § 1.633(e) adopts the estoppel rule approved by the Court of Customs and Patent Appeals in *Avery* v. *Chase*, 101 F.2d 205, 40 USPQ 343 (CCPA 1939), *cert. denied*, 307 U.S. 638 (1939), while rejecting the rule announced by the U.S. Court of Appeals for the District of Columbia Circuit in *International Cellucotton Products Co.* v. *Coe*, 35 F.2d 869, 30 USPQ 366 (D.C. Cir. 1936). See also *American Cyanamid Co.* v. *Coe*, 106 F.2d 851, 42 USPQ 302 (D.C. Cir. 1939). The commentator is correct in noting that the rules adopt the estoppel rule approved in *Avery* v. *Chase*. The following comment by the CCPA in its opinion in *In re Shimer*, 69 F.2d 556, 558, 21 USPQ 161, 163 (CCPA 1934), accurately expresses the intent of the PTO in promulgating §§ 1.633(e) and 1.658(c):

> It may be stated that this rule works no hardship to him who is diligent in pursuit of his rights. When an interference is declared, the files of his contestants are open to him. He has full cognizance of their disclosures and claims. So advised, it becomes his duty to put forward every claim he has. [Rule 1.633(e)] . . . affords him this opportunity. If the rule be not enforced or enforceable, then delays and litigation are greatly increased. It is quite obvious that the doctrine of estoppel, as applied in these cases, results in the better conduct of the business of the Patent [and Trademark] Office and in the public good.

One comment suggested that the following be added to the end of § 1.633(c):

> A motion to add or substitute a count shall be construed as an automatic request for the benefit of any earlier application [filing] dates accorded the existing count, and also as encompassed by a contemporaneous motion under § 1.633 (f) or (g), unless indicated otherwise. Any opposition thereto must be raised in a motion opposition pursuant to § 1.638.

The suggestion is not being adopted. A specific reference to § 1.637(c) appears in § 1.633(c). The provisions of § 1.637(c) spell out in detail the steps which a moving party must take in filing a motion under § 1.633(c). One of those steps requires the moving party to request benefit of any earlier application. The mere fact that benefit has been accorded for a "first" count does not establish that benefit should be accorded for a "second" count. The PTO believes the burden should be on the moving party to point out where an earlier application supports a count rather than placing the burden on an opponent in the first instance to point out where an earlier application fails to support particular subject matter. There is no compelling reason to force the opponent "to prove a negative." It should be noted that the language "Where appropriate," has been deleted in every instance from §1.637 to make clear that the burden lies on the moving party to request benefit when that party files a motion under § 1.633.

At the hearing, one individual commented that § 1.633(a) is not clear as to whether a motion for judgment based on "fraudulent appropriation of the moving party's invention by his opponent" excluded. The "fraudulent appropriation of the moving party's invention by his opponent" is derivation. Section 1.633(a)(2) excludes both "innocent" derivation (e.g., through a third party and unknown to either party in an interference) or "fraudulent" derivation (e.g., where one party knowingly takes the invention from an opponent). In either event if derivation by an opponent of a party's invention is proved, the party will be awarded judgment.

One comment made the following statement:

> An opponent faced with a motion for judgment on the ground that a count is unpatentable may not be able to prove patentability in the short time periods. Provision should be made for extensions of time in such cases.

Provisions for extensions of time are made in § 1.645.

One comment addressed Example 23 which appeared in the notice of proposed rulemaking. Example 23 also appears in a slightly modified form herein and, as modified, takes into account discussion in the comment. The commentator believed that the motion mentioned in Example 23 should be denied and that a testimony period should be set. Accordingly to the commentator, the granting of the motion would shift the burden to the opponent of the motion. The commentator's point

is well taken. Actually, the motion should be deferred to final hearing and a testimony period would be set. In ruling on motions under § 1.633, it will not always be possible for the examiner-in-chief to grant or deny outright a motion. When testimony is needed to rule on a motion, the proper course of action is to defer a decision on the motion to final hearing and permit testimony. See § 1.639(c). The moving party retains the burden. If testimony is taken on patentability, the parties would also have to take testimony on priority. With all testimony at its disposal, the Board would then be in a position to rule on all issues and award a judgment.

One comment asked how the claims of the parties would be designated to correspond to the counts if in Example 18 a motion to substitute Count 2 (benzene) and add Count 3 (chloroform) was granted. The following Example 36 answers the commentator's question.

Example 36. The facts in this example are the same as Example 18. Assume that applicant AB believes that benzene and chloroform define separate patentable inventions. Applicant AB would file a motion under § 1.633(c)(1) to substitute Count 2 (benzene) for Count 1 (Markush group of benzene or chloroform) and add Count 3 (chloroform). If the examiner-in-chief grants the motion, the interference would be redeclared by deleting Count 1 and substituting in its place Counts 2 and 3. Claims 1 and 2 of the patent H and claims 11 and 12 of application AB would be designated to correspond to Count 2. Claims 1 and 3 of patent H and claims 11 and 13 of application AB would be designated to correspond to Count 3. If one party proves priority with respect to both benzene and chloroform, that party would be entitled to all claims in its application or patent corresponding to Counts 2 and 3. The other party would not be entitled to a patent containing any claim corresponding to Counts 2 and 3. If patentee H proves priority with respect to benzene and applicant AB proves priority with respect to chloroform (assuming there was no issue raised at final hearing with respect to the patentable distinctness of benzene and chloroform), the judgment would provide that patentee H is not entitled to a patent with claims 1 and 3, but is entitled to a patent with claim 2 and that applicant AB is not entitled to a patent with claims 11 and 12, but is entitled to a patent with claim 13. If an issue is properly raised at final hearing as to whether benzene and chloroform are the same patentable invention and the Board holds that they are the same patentable invention, the party proving the earliest priority as to either benzene or chloroform would prevail as to all claims. Thus, if patentee H invented benzene before applicant AB invented benzene or chloroform, patentee H would be entitled to a patent containing claims 1 through 3 even if applicant AB invented chloroform before patentee H invented chloroform. Applicant AB would not be entitled to a patent with claims 11 through 13.

An oral comment was received by telephone which raised the question of whether a party is, or could be, required to present in the party's application every claim which the party may ever seek to obtain in a patent based on the party's application. According to the commentator, such a requirement would prevent the party from proceeding *ex parte* after the interference on any claim on which a favorable judgment was not entered. It is not the PTO's intent to require a party who is an applicant to present at the outset all claims which the party may ever seek to obtain in a patent based on his application. Parties in interference cases should recognize, however, that the interference estoppel provisions of § 1.658(c) have been expanded with the view to eliminating much of the *ex parte* maneuvering which has taken place in the past after an interference is terminated. Accordingly, a party who fails to move to place a matter in issue runs a considerable risk that the party will not be able to raise the issue *ex parte* after an interference is terminated. Nevertheless, the PTO has determined that it will not, at this time, adopt the requirement suggested by the commentator. The commentator also suggested, contingent on his earlier suggestion being rejected, that the rules provide that a party be authorized to file a motion to require an opponent who is an applicant to add a claim to the opponent's application and to designate the claim as corresponding to a count. This suggestion is being adopted by addition of § 1.633(c)(5). Paragraph (c)(5) authorizes the filing of a motion to redefine the interfering subject matter by requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. A companion addition of paragraph (c)(5) to § 1.637 sets out the requirements of a motion under § 1.633(c)(5). Those requirements are: the moving party must: (1) Propose a claim to be added to the opponent's application, (2) show the patentability of the claim to the opponent and apply the terms of the claim to the disclosure of the opponent's application, (3) identify the count to which the proposed claim shall be designated to correspond, and (4) show that the proposed claim defines the same patentable invention as the count to which it will be designated to correspond. The following example illustrates how practice under §§ 1.633(c)(5) and 1.637(c)(5) is expected to occur.

Example 37. In this example, some of the facts set out in Example 32 will be used. Application AV discloses engines and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). Seeing that application AV specifically discloses a 6-cylinder engine and believing that a 6-cylinder engine is the same patentable invention as "engine," AW could move under § 1.633(c)(5) to require applicant AV to add a claim (6-cylinder engine) and to have the claim designated to correspond to the count (engine). Applicant AV could oppose on the ground that a 6-cylinder engine is not the "same patentable invention" as "engine." If the motion is granted, applicant AV would be required to add a claim to 6-cylinder engine and the claim would be designated to correspond to the count. If applicant AV loses the interference, the judgment would preclude applicant AV from obtaining a patent with claims to "engine" or "6-cylinder engine." If the motion is denied on the basis that a 6-cylinder engine is not the same patentable invention, applicant AV would not be required to present a claim to 6-cylinder engine and would be able to pursue such a claim *ex parte* even if applicant AV loses the interference.

If an applicant is ordered by an examiner-in-chief to file an amendment to present a claim and the applicant fails or refuses to timely present the amendment, the failure or refusal will be taken without further action as a disclaimer by the applicant of the subject matter of the claim. See the second sentence of § 1.640(b)(1).

At the hearing, one commentator indicated that it is not clear whether § 1.635 "would permit a motion for judgment in a situation where a junior party's case-in-chief fails as a matter of law to overcome a senior party's effective filing date." Under the rules, it is not the intent of the PTO to allow a senior party to test the sufficiency of the case-in-chief of a junior party prior to final hearing. Thus, a "motion for a directed verdict" (see Rule 50(a) of the Federal Rules of Civil Procedure) at the conclusion of the junior party's case-in-chief and prior to a senior party's case-

in-chief is not authorized under the rules. If a senior party believes the case-in-chief of the junior party is insufficient as a matter of law, the senior party may *elect* to proceed immediately to final hearing. If the senior party is incorrect, however, the senior party will have waived any right to present any case-in-chief or rebuttal. See e.g., *Comstock* v. *Kroekel*, 200 USPQ 548, 550 n. 4 (Comm'r.Pat. 1978); *Lorenian* v. *Winstead*, 127 USPQ 501, 506 (Bd.Pat.Int. 1959); and, more recently, *Burson* v. *Carmichael*, 731 F.2d 849, 221 USPQ 664 (Fed. Cir. 1984) ("There is no support in law for repeated bites at the apple"). This would be true even if the only evidence relied upon by the junior party is a showing under 1.608(b). In this respect, the rules codify the decision in *Walsh* v. *Sakai*, 167 USPQ 465 (Comm'r.Pat. 1970).

Two comments were received which suggested that the twenty-day period in § 1.636(b) is too short. It was suggested that a longer time period be set and one comment suggested thirty (30) days. The suggestions are not being adopted. The time period set for filing oppositions will normally be set during a telephone conference call between the examiner-in-chief and the attorneys for the parties. The twenty-day period appears in the rule in the event a specific time for filing oppositions is not set by an examiner-in-chief. The twenty-day period is deemed to be sufficient in most cases. Twenty days are currently allowed to respond to a motion. See 37 CFR 1.231(b). It should be noted that the twenty-day period is longer than the minimum period allowed by the Federal Rules of Civil Procedure for responding to motions. See Rule 6 (d) and (e).

Two comments were received which discussed § 1.637. Both comments suggested that a sentence be added to § 1.637(f)(2) to require a translation to be filed when a party moves for benefit of an earlier foreign application which is not in English. The suggestions are being adopted and the following has been added as the last sentence of § 1.637(f)(2): "If the earlier application filed abroad is not in English, the requirements of §1.647 must also be met." Section 1.647 requires a translation whenever a party relies on a document in a language other than English. One comment suggested that the language of § 1.637(f)(3) ("Show that the earlier application discloses an embodiment within the scope of each count.") may be "contrary to past decisions of the CCPA which have held a disclosure can be good without a specific embodiment." The critical issue in each benefit situation is whether the earlier application constitutes a constructive reduction to practice of the invention defined by the count. The issue is necessarily resolved on a case-by-case basis and the presence or absence of an embodiment is only one factor to be considered. Accordingly, the language of § 1.647(f)(2) has been changed to read: "Show that the earlier application constitutes a constructive reduction to practice of each count." The comment also criticized the use of the word "each" in § 1.647(f)(2). The term "each" is used to make clear that when there are two or more counts, the moving party must show that the earlier application constitutes a constructive reduction to practice for each count. There are cases where a disclosure in an earlier application would constitute a constructive reduction to practice for one count but not for another count.

Several changes have been made to § 1.637 which were not made as a result of a comment submitted from the public. Each occurrence of the language "Where appropriate," in § 1.637 has been deleted as being unnecessary and possibly confusing. Whenever a party wants or believes that it is entitled to benefit of an earlier application, the party must file a motion under § 1.633(f) for benefit. The language "Where appropriate" may have given parties the mistaken impression that a motion was not necessary where benefit of the earlier application had been accorded in the papers declaring the interference. See the discussion above of the suggested change to §1.633(c) which was rejected.

The language "or adding a claim to be designated to correspond to a count" has been added to § 1.637(c)(2). The change supplements a change made in § 1.633(c)(2). Section 1.637(c)(2) sets out the requirements for a preliminary motion to redefine the interfering subject matter by adding a claim in the moving party's application and to designate the claim to correspond to a count.

In § 1.637(c)(2)(ii), the language "Apply the terms of each proposed claim to the disclosure of the application" has been changed to "Show that the proposed or added claim defines the same patentable invention as the count". This change was made to add the requirement of showing that the new claim defines the same patentable invention as the count and to eliminate a requirement already contained in §1.637(c)(2)(iii).

Section 1.637(c)(2)(iii) was changed to refer to an "amended or added claim" and thereby conform the language of the section to the language of § 1.633(c)(2).

Paragraph (c)(5) was added to set out the requirements of a motion under § 1.633(c)(5) which permits a party to move to require an opponent who is an applicant to add a claim to the application and to designate the claim to correspond to a count. See Example 37.

Two comments were made concerning § 1.638. One comment suggested that the twenty-day periods of paragraphs (a) and (b) were too short. The PTO has evaluated the time periods of paragraphs (a) and (b) and has decided that no change will be made to those periods. Attention is directed to the discussion above of the comments concerning § 1.636(b) which also contains a twenty-day period.

Another comment made at the hearing suggested that a reply to an opposition to a motion should be permitted as a matter of course. Upon consideration of the comment, it has been decided to authorize the filing of replies to opposition to all motions. Presently, replies are permitting as a matter of course only for oppositions to motions under 37 CFR 1.231. Section 1.638(b), as changed, would permit the reply in every instance. The PTO over the years has received complaints concerning the inability of a party to file replies. The change being made in § 1.638(b) will be reviewed sometime in the future to determine whether authorizing replies is helpful to the Board and/or whether undue delay in resolving interference occurs because replies are filed. Moreover, the PTO will make a judgment on whether "new issues" are being raised as a matter of course in replies. It can thus be seen that the change in authorizing replies may be considered experimental and could be changed in the future if found to be counter-productive or inconsistent with the objective of resolving interferences in a relatively prompt manner.

One comment discussing § 1.639 was received. The comment states:

> The requirement that proofs of alleged material facts *must* be filed may be difficult or impossible to meet in view of the shortened times. [The] rule should make provisions for timely submission of proofs within reasonable times.

To the extent that the comment suggests setting specific times in the rules, the suggestion is not being adopted. It should be noted that if affidavits cannot be timely prepared to be filed with a motion, the moving party may wish to take advantage of paragraph (c) which requires a party to specify any testimony needed to resolve a motion.

One change was made in § 1.639(c) to make clear that a moving party or an opponent may describe any testimony

needed to resolve a motion under either § 1.633 or § 1.634. Often, testimony is needed to resolve inventorship disputes. Accordingly, a party may describe testimony needed to resolve motions to correct inventorship under § 1.634. It should be noted that if a party relies solely on affidavits in support of a motion (under § 1.633 or § 1.634) and the issue raised in the motion is to be considered at final hearing, the party must comply with § 1.671(e).

Several comments were received which discussed § 1.640. One comment asked: "When the final sentence speaks of a panel deciding the request for reconsideration, does this mean that the panel decides whether to reconsider or whether to modify the decision?" It was the PTO's intent that the panel make a decision on whether to modify the decision made by the single examiner-in-chief. Accordingly, the language "shall be decided by a panel" in the last sentence of § 1.640(c) has been changed to read: "shall be acted on by a panel". Another change in language to the fourth sentence of § 1.640(c) has been made to make clear that a decision of a single examiner-in-chief will not ordinarily be modified by a panel without an opportunity to file an opposition.

Another comment suggested that § 1.640(a) be changed to "allow, even encourage, the examiner-in-chief to travel to conferences where more convenient/practical for all concerned." This suggestion is not being adopted. The use of a telephone conference call eliminates the need to adopt the suggestion. The same comment suggested that the "speedy and inexpensive" language of the second sentence of § 1.640(b) be deleted. The suggestion is not being adopted. The comment fails to explain why the language should be deleted. It is obvious that a motion cannot always be granted or denied; other action is often appropriate, e.g., deferring consideration of a motion to final hearing. Section 1.640(b) gives the examiner-in-chief discretion to take appropriate action and the "just, speedy, and inexpensive determination" language provides some standard which an examiner-in-chief may follow in those cases where granting or denying a motion is not appropriate.

One comment was received which suggested that § 1.640 be changed to provide that an examiner-in-chief hold a hearing to determine whether an interference should proceed in those cases where a junior party fails to allege a date prior to the senior party and remains in an interference only because the junior party is alleging "fraud" by the senior party. The suggestion is not being adopted. If a party believes that an opponent has committed "fraud" or has engaged in "inequitable conduct," the party may file a motion under § 1.633(a) for judgment. Obviously, a motion for judgment on the basis of "fraud" or "inequitable conduct" must make out a case by clear and convincing evidence. The examiner-in-chief has sufficient authority under the rules to preclude a party from proceeding in an interference on a baseless charge of "fraud" or "inequitable conduct."

One oral comment was received which suggested that the examiner-in-chief be required to consult with an examiner prior to deciding a preliminary motion for judgment under § 1.633(a) based on patentability. The oral comment suggested alternate proposals:

(1) The examiner-in-chief will normally obtain a patentability report when deciding motions involving a question of patentability.

(2) The examiner-in-chief will consult with a primary examiner prior to deciding a motion raising an issue of patentability.

The suggestion of the oral comment is not being adopted. An examiner-in-chief is a person having "competent legal knowledge and scientific ability." 35 U.S.C. 7. Examiners-in-chief review decisions of examiners on questions of patentability. Accordingly, there is no reason to *require* an examiner-in-chief to consult with an examiner on a question of patentability. The PTO recognizes that many examiners possess special expertise in particular arts. It is for this reason that § 1.640(b) provides that "[a]n examiner-in-chief *may* consult with an examiner in deciding motions involving a question of patentability" (emphasis added). Thus, an examiner-in-chief is authorized to consult with an examiner on a question of patentability where the examiner-in-chief believes consultation will be beneficial.

One comment suggested that § 1.642 be changed to permit an examiner-in-chief to add a newly discovered patent, as well as newly discovered applications, to an interference. Inasmuch as 35 U.S.C. 135(a) authorizes interferences between applications and patents, the suggestion is being adopted. The language "application" in § 1.642 has been changed to read: "application or patent".

Several comments discussing § 1.644 were received. One commentator made four suggestions, none of which are being adopted. First, the commentator suggested that there should be no fee for a petition under § 1.644(a)(1). This suggestion is not being adopted. A decision on a petition is a service performed by the PTO on behalf of a petitioner. The Commissioner is authorized to charge fees for services performed. 35 U.S.C. 41(d). Second, the commentator suggested that the last sentence of § 1.644(d) be deleted. This suggestion is not being adopted. In the past when parties have filed petitions, copies of documents already in the interference file have been attached to the petition. The copies tend to increase unnecessarily the size of the file of an interference. Inasmuch as the document submitted with the petition is already in the interference, there is no need to file a "second" copy of the document. Parties can expect that petitions will be returned (§ 1.618) if the petition is accompanied by documents which are already in the interference file. Third, the commentator argued that the "requirement of service within one (1) day is too onerous and should be deleted" from § 1.644(g). No rationale was given in support of the argument. Petitions have caused considerable delay in interference cases in the past. To avoid unnecessary delay and surprise on the part of the opponent, the PTO has decided to require that service of a petition be such that delivery to the opponent is within one (1) working day. Service within one day should not ordinarily be difficult in view of "Express Mail" and numerous commercial one-day delivery services available. Lastly, the commentator suggested that § 1.644(i) be changed to provide that decision on a petition would not be delegated to the examiner-in-chief handling the interference. The suggestion to change § 1.644(i) is not being adopted. However, when a PTO employee is granted authority to decide a petition in an interference case, the employee would not be the examiner-in-chief handling the interference or an employee on a panel of the Board deciding the petition. It would be expected that an employee deciding a petition by delegation of authority would be one who could exercise independent judgment on the petition bearing in mind that a petition will be decided on the record made before the examiner-in-chief or the panel. In connection with this latter point, findings of fact by an examiner-in-chief or the Board will be presumed to be correct unless shown to be clearly erroneous. Discretionary action by an examiner-in-chief or the Board will not be overturned unless it is shown that an abuse of discretion occurred.

One commentator asked the following: "Is § 1.644(g) intended to

apply only to 'oppositions' to § 1.644 petitions, or is it also applicable to § 1.638 oppositions?" The provisions of § 1.644(g) apply only to petitions filed under § 1.644; those provisions do not apply to oppositions under § 1.638.

Two comments suggested that § 1.644(a)(2) be changed to include an express statement that a petition under paragraph (a)(2) could not be filed until after the Board has entered judgment and that the petition could not relate to the merits of priority of invention or patentability or a question of whether evidence is admissible under the Federal Rules of Evidence. The suggestions are being adopted and appropriate language has been added to § 1.644(a)(2) after the word "Commissioner". The change was suggested by the commentators so that no reasonable person could possibly overlook the fact that a petition to exercise supervisory authority can be filed *only after entry of judgment.* It should be noted that the language "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under the Federal Rules of Evidence" has been deleted from § 1.644(b) in view of the change to § 1.644(a)(2).

One comment suggested that the last sentence of § 1.644(f) be changed to make clear that a decision would not ordinarily be modified until the Commissioner had requested an opposition to a request for reconsideration. This suggestion has been adopted and an appropriate change has been made to the last sentence of § 1.644(g).

One comment suggested that the word "shall" in the last sentence of § 1.644(b) precludes the filing of an opposition beyond the 15-day period specified in the rules. According to the commentator, the opposition should also be considered timely if filed within "any appropriate extension." A party may move to extend the time for filing an opposition. See § 1.645.

One comment argued that § 1.644(a)(1) cannot "be squared with the statute as interpreted in *Myers* [v. *Feigelman,* 455 F.2d 596, 172 USPQ 580 (CCPA 1972)]." The rationale in support of the comment is the following:

> I presume that the limitation in subparagraph (b) that a petition under subparagraph (a)(2) "shall not relate to . . . the merits of priority of invention or patentability or . . . the admissibility of evidence" is intended to avoid conflict with *Myers* v. *Feigelman,* 172 USPQ 580 (CCPA 1972), and its progeny. However, I read *Myers* as saying that, if the board has statutory authority to make a decision (including all the myriad of ancillary decisions that the panels and/or the single examiner-in-chief will be making under the new procedure), then the Commissioner does not have authority to review the board's or the single examiner-in-chief's decision. Or, to put it the other way around, if the Commissioner reviews an examiner-in-chief's decision, he is stepping into the shoes of the examiner-in-chief, and the Commissioner's decision is in turn reviewable by the panel (which is, of course, the only entity authorized to exercise the *statutory* jurisdiction of the board—see *Knickerbacker Toy Co.* v. *Faultless Starch Co.,* 175 USPQ 417 n.8 (CCPA 1972)). Thus, I don't see how proposed section 1.644(a)(1) can possibly be squared with the statute as interpreted in *Myers.*

It is true that the CCPA has stated that, "in performing his duties, the Commissioner cannot usurp the functions or impinge upon the jurisdiction of the Board . . . established by 35 U.S.C. 135." *In re Dickinson,* 299 F.2d 954, 958, 133 USPQ 39, 43 (CCPA 1962). See also *Myers* v. *Feigelman, supra,* 455 F.2d at 599 n. 8, 172 USPQ at 583 n. 8. However, it is also true that the Commissioner "shall superintend or perform all duties required by law respecting the granting and issuing of patents . . . ." 35 U.S.C. 6; *Kingsland* v. *Carter Carburetor Corp.,* 83 U.S. App. D.C. 266, 168 F.2d 565, 77 USPQ 499 (D.C.Cir. 1948); *In re Staeger,* 189 USPQ 284, 285 n. 2 (Comm'r.Pat. 1974). The Commissioner, subject to approval of the Secretary of Commerce, establishes the procedure by which the examiners-in-chief and the Board will consider interference cases. 35 U.S.C. 6. See also 35 U.S.C. 23 relating to affidavits and depositions.

Under the rules, the Commissioner will not determine on petition either "priority of invention" or "patentability." See § 1.644(b). Likewise, the Commissioner will not consider whether evidence should have been admitted or excluded under the Federal Rules of Evidence. The PTO believes that the federal courts, which routinely rule on admissibility under the Federal Rules, are in a better position to determine whether the Board properly interpreted the Federal Rules of Evidence.

While the Commissioner will not decide "priority of invention" or "patentability" under 35 U.S.C. 135(a), it does not follow that the Commissioner is precluded from interpreting PTO rules on procedural matters, including procedural matters related to the admissibility of evidence on some basis other than the Federal Rules of Evidence, e.g., whether a party has complied with a PTO rule such as § 1.671(e) (procedure for relying on affidavits) or § 1.671(g) (permission required for obtaining evidence by subpoena).

Full consideration has been given to the comment. The PTO nevertheless believes that § 1.644(a)(1) is not inconsistent with law.

Several comments concerning § 1.645 were received. One comment suggested that "to" be inserted in the first sentence of paragraph (a) before "file a notice of appeal" and "commence a civil action". According to the comment, "[t]he use of parallel infinitive verb forms provides greater clarity to the rule." The suggestion has been adopted.

Another commentator said the following:

> No good reason is seen to require a notarized oath from an attorney merely to explain why a paper was filed late, if there is no claim of substantive prejudice by other parties. Attorneys and examiners-in-chief should not be spending unnecessary time and effort on merely procedural formalities. That is contrary to the intent of the new rules.

The PTO agrees with the commentator and has deleted the language "accompanied by an affidavit" from § 1.645(b).

One comment suggested that a reference to § 1.610(d)(6) which provides for oral requests should be inserted into § 1.645 to reflect intent stated in the comments [of the notice of proposed rulemaking] on proposed § 1.645." This suggestion is not being adopted. As the commentator notes, § 1.610(d) authorizes an examiner-in-chief to hold a conference call to resolve issues and to enter an appropriate order following the conference call. A conference call may be used to obtain an extension of time. If the examiner-in-chief grants the request, an order may be entered—in which case a written motion is not necessary. The order provides the written record required by 37 CFR 1.2. However, it would unduly lengthen the rules to insert a reference to § 1.610(d) in each rule to which it may be applicable. Section 1.645(a) specifies the procedure to be used when a written motion is filed. It should be noted that an examiner-in-chief may require a written motion notwithstanding a conference call.

One comment stated that "[t]he 'other business' may be more pressing than the Interference. In order to serve the ends of justice, the PTO should be considerate in this matter." The PTO intends to evaluate each request for an extension of time on a case-by-case basis. However, extensions of time in interference cases have become "routine." A recent survey of a file in one interference revealed the following. The interference was declared on March

30, 1976. Preliminary statements were filed on May 5, 1979. A decision on motions was entered on June 28, 1982. Testimony was filed on January 3, 1984. During the period between declaration and filing of testimony, sixty-four (64) requests or stipulations for extension of time were filed.

When counsel and an examiner-in-chief agree to a schedule and times are set, the parties will be expected to adhere to the schedule unless there are unusual circumstances. Apart from work that counsel may have in an interference, an examiner-in-chief will have a docket and must manage not only the interference involving counsel, but numerous other interferences. The U.S. Court of Appeals for the Federal Circuit recently said the following in *Rosemount, Inc.* v. *Beckman Instruments, Inc.*, 727 F.2d 1540, 1549-1550, 221 USPQ 1, 10 (Fed. Cir. 1984):

> The conduct of a trial, granting of continuances and the like, is not, however, solely or entirely a matter of balancing conveniences of the parties. The Federal Rules of Civil Procedure recognize another consideration—the need for the exercise of discretion by the trial court in carrying out its duty of managing the judicial process, the business of the court, and the administration of justice.

Likewise, these rules also recognize the need for the exercise of discretion by an examiner-in-chief in carrying out his or her duty of managing the interference (§ 1.610), the business of the PTO (§ 1.610), and the administration of justice (§ 1.601).

Several comments were received which discussed § 1.646. One comment suggested that it would be clearer if "service" was inserted after "additional" in the last sentence of § 1.646(b). This suggestion has been adopted.

Another comment suggested that "or except as otherwise provided in these Rules" be added to § 1.646(c) after "otherwise ordered by an examiner-in-chief". The commentator pointed out that the change was needed because certain rules (§§ 1.644(g) and 1.658(b)) require service by "Express Mail" or by hand. The commentator accurately pointed out that adding the suggested phrase "will call attention to the fact that there are other rules which have their own requirements for service of papers." The suggestion has been adopted, except that "this part" has been used instead of "these Rules."

One comment suggested changing "time" to "date" in the last sentence of § 1.646(e). The suggestion has been adopted. The change is necessary to conform with the language of the rule to actual practice and other language in the rule.

Two comments suggested that § 1.646(d), which authorizes an examiner-in-chief to order service by hand or "Express Mail," be deleted. This suggestion is not being adopted. The use of "Express Mail" or delivery by hand is often desirable to expedite matters or to avoid unnecessary delay. One comment argued that delivery by hand may be prohibitive. Commercial couriers may be used to accomplish delivery by hand. The fee charged by most commercial couriers is not "prohibitive." The other comment argued that "there are circumstances when . . . [delivery by hand] is [not] possible." The use of § 1.646(d) is discretionary on the part of an examiner-in-chief. If delivery by hand, i.e., personal delivery or delivery by commercial courier, or by "Express Mail" is impossible, it would be expected that the examiner-in-chief would exercise discretion and permit service by first class mail.

One comment suggested that the language "present case," which was said to appear in § 1.651(b)(1) and § 1.651(c), be changed to "prepared case." The suggestion is not being adopted because the language "present case" does not appear in § 1.651. In any event, a testimony period is set for a party to present its testimony—either case-in-chief or case-in-rebuttal.

One comment was received which made two suggestions regarding § 1.652. First, the comment suggested that a period longer than 15 days be set for filing a response to a paper answering an order to show cause. This suggestion is not being adopted. The fifteen-day period is believed to be adequate in most cases. If more time is needed, a party may file a motion under § 1.645. Second, the comment suggested that the party placed under an order to show cause should be permitted as a matter of course to file a "reply" brief. This suggestion is not being adopted. In those instances where the Board believes a "reply" brief is desirable it may authorize the filing of a "reply."

One comment argued that § 1.653(i) "fails to make provision for exhibits which are too big to file or are too dangerous to file." If an "exhibit" cannot be filed, it will not be given consideration. A party will have to rely on testimony and/or pictures or sketches for "exhibits" (e.g., a large machine in a factory) which are too large or too dangerous to be filed in the PTO.

While no comments were received concerning § 1.654, it should be noted that a new paragraph (c) has been added and paragraph (c) as set out in the notice of proposed rulemaking has been redesignated as paragraph (d). New paragraph (c) provides that a party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under § 1.632 was timely filed.

Two comments discussing § 1.655 were received. The first comment made the following statement regarding § 1.655(a):

> Last sentence—interlocutory orders are reviewed only for 'manifest error' etc. It is not clear whether this includes show cause orders under § 1.640 resulting from unpatentability determined under § 1.633(a). However, if so, it precludes proper review of the patentability determination.

Patentability will initially be determined by a single examiner-in-chief. See §§ 1.610(a) and 1.640(b). If the examiner-in-chief determines that a claim of a party is unpatentable to that party, an order to show cause why judgment should not be entered as to that claim will be issued to that party. See § 1.640(d). If a response to the order to show cause is filed, a decision will be entered by the Board. See §§1.610(a) and 1.640(e). If the Board determines that the claim is not patentable to the party, a final decision and judgment will be entered holding the claim to be unpatentable. Review of the final decision and judgment is by judicial review under 35 U.S.C. 141 or 146. It should be noted, however, that if there are other claims in the party's application or patent which are deemed to be patentable, an interlocutory order would be entered holding only that certain claims are unpatentable. A final order holding those claims unpatentable would be entered after final hearing on other issues. Such a practice will avoid piecemeal judicial review.

Another comment suggested that § 1.655 be changed to preclude consideration of patentability at final hearing. Pub. L. 98-622 authorizes consideration of patentability assuming patentability is properly raised by a party during the interlocutory phase of an interference.

Two comments discussing § 1.656 were received. One comment suggested that "[b]riefs should be letter size for consistency." The PTO has no preference for the size of briefs. Briefs may be filed on letter or legal-size paper. Inasmuch as the federal courts now require letter-size paper, parties who intend to use a PTO brief as an exhibit in a federal court should use letter-size paper.

Another comment suggested that § 1.656 be amended to preclude a single examiner-in-chief from ruling on admissibility of evidence. The introductory remarks to the notice of proposed rulemaking (and this notice) state that "[t]he examiner-in-chief, *where appropriate*, will be available by phone to rule on the admissibility of evidence in the event parties encounter *unusual* problems during the taking of depositions" (emphasis added). The commentator states:

> If an examiner-in-chief has ruled certain evidence inadmissible, that evidence would presumably not be before the Board at final hearing. Proposed Rule 1.656(h) provides a means for a party to obtain suppression of evidence to which he has made timely objection, but the Rule does not provide for any means for a party whose proffered evidence has been held inadmissible by the examiner-in-chief, to have that holding considered by the Board

The change suggested by the comment will not be adopted. However, a brief explanation of how practice is expected to work is in order. The introductory remarks indicate that a single examiner-in-chief may rule on admissibility of evidence "where appropriate" and in "unusual" circumstances. There are times during interferences where a motion *in limine* can be helpful. For example, a junior party during its case-in-chief may wish to examine a witness on a document which was *not* served as required by § 1.673(b)(1). The senior party objects and realizes that if the junior party is permitted to examine the witness on the document, extensive cross-examination using numerous documents would be necessary. In order to avoid wasting considerable time, the parties could contact the examiner-in-chief by phone for a determination *in limine* whether the junior party should be able to examine the witness on the document. Under the circumstances outlined the examiner-in-chief in his or her discretion could enter an order excluding the document from evidence. The order would be subject to a request for reconsideration. See § 1.640(c). Ordinarily, however, it would be expected that parties would present evidence subject to objection. See § 1.675(c), last sentence. It is not envisioned that single examiner-in-chief will routinely rule on the admissibility of evidence.

Several comments discussing § 1.658 were received. One comment suggested that the 14-day time period in § 1.658(b) is too short. Section 1.658(b) provides that a party may file a request for reconsideration within 14 days of a final decision by the Board. The 14-day time period is the same period authorized for filing requests for reconsideration by the U.S. Court of Appeals for the Federal Circuit. See Rule 40(a) of the Federal Rules of Appellate Procedure.

Several individuals suggested that a less restricted "interference estoppel" be set out in § 1.658(c). While full consideration has been given to the suggestion, it has been decided to retain in these rules the interference estoppel provisions of § 1.658(c) essentially as proposed. "Interference estoppel" under § 1.658(c) is designed to implement the PTO's intent to have as many issues resolved as possible in a single *inter partes* proceeding. Numerous examples in this notice illustrate how practice is expected to take place under § 1.658(c).

The language in the second sentence of § 1.658(c) has been changed to more clearly state the nature of the estoppel and the exception to estoppel. The word "counts" in the second sentence of § 1.658(c) means the counts as they exist at the time a final decision is entered.

One comment was received concerning § 1.658(c) which requires a specific answer. The commentator made the following statement:

> You state that an estoppel would not apply against a party awarded a favorable judgment as to *all* counts. However, it seems to me that there will be occasion when it would not be appropriate to have estoppel where there was a split decision. For instance, consider an interference between applicants A and B in which A was awarded priority as to count 1 and B was awarded priority as to count 2. If I understand you correctly, A would be estopped in post-interference *ex parte* practice to present an additional claim X which was patentably indistinct from his claim corresponding to count 1 if B had support for claim X. I think this result would be unfortunate, and that A should be permitted to further refine his claim structure after the interference—that is, after he has been assured that he is entitled to claims to the basic invention recited in count 1.

Under the circumstances described by the commentator, inventor A would *not* be estopped to present a claim to X because X is "patentably indistinct" (the proper terminology under the rules would be to say X is the "same patentable invention" as the subject matter of count 1) from the subject matter of count 1. Inventor A would be entitled to claim any disclosed invention which is directed to the "same patentable invention" as count 1. The change in the second sentence of § 1.658(c) more clearly reflects the PTO's intent in this regard. Inventor A would *not* be entitled to claim any invention which is the "same patentable invention" as the subject matter of lost count 2. See Examples 26, 27, and 28 for illustrations of interference estoppel practice when a "split" judgment is entered.

Two comments were received discussing § 1.659. One comment suggested that the first sentence of § 1.659(b) should "reflect" that a reexamination may be based only on patents and printed publications. The suggestion is not being adopted. The basis upon which a reexamination may be instituted are set out elsewhere in the statute and rules. 35 U.S.C. 301–306; 37 CFR 1.501–1.570. There is no further need to set that basis out again in § 1.659(b). Another comment suggested that the language "not involved in the judgment of the interference" be deleted from § 1.659(b). The rationale in support of the comment was as follows:

> Besides introducing a potential ambiguity as to what claims were 'involved in the judgment,' there does not appear to be any good reasons to draw this distinction, particularly unless it is made more specific. Why should the Board be prevented from recommending reexamination of some (less relevant) patent claims and not other patent claims which are potentially even more relevant to the public, unless *all* of the *same art* has already been fully evaluated against the *same claims* in the Board's decision? (emphasis in original).

When a patent is involved in an interference, each claim of the patent will be designated to (1) correspond to a count *or* (2) not correspond to a count. All claims which are *ultimately* determined to correspond to a count will be "involved in the judgment of the interference." Inasmuch as they are involved in the judgment of the interference, there is no need to recommend reexamination of those claims. The claims involved in the interference are either patentable or unpatentable based on the final decision of the Board. Section 1.659(b) merely authorizes the Board to recommend reexamination of patent claims which (1) are *not* involved in the judgment and (2) for one reason or another neither party saw fit to move to designate as corresponding to a count.

One comment was received which suggested that the requirements of § 1.660 are unnecessary. The PTO disagrees. The requirements of § 1.660 are designed to keep the PTO and a party's opponent informed of activity which is relevant to an interference. These rules attempt, to the extent possible, to eliminate procedural surprise. Inasmuch as mail delays occur and the PTO cannot react instantaneously to every paper filed in connection with every application or patent, the provisions of § 1.660 are believed helpful in preventing surprise

on the part of opponent's and unnecessary work by examiners-in-chief or the Board due to a lack of knowledge of relevant activity which may be taking place in the PTO.

One comment suggested that at the end of § 1.661 the following be added: "and the time for any such available appeal or review has expired." The suggestion is not being adopted. Section 1.661 already provides for finality when "no appeal . . . can be taken. . . ." The language finds antecedent basis in 35 U.S.C. 135(a).

Several comments discussing § 1.662 were received. Two comments suggested a change be made to provide that when a patentee files a statutory disclaimer under 35 U.S.C. 253 and deletes *all* claims corresponding to a count, the disclaimer will be treated as a request for judgment. As one of the comments pointed out, "[s]ince . . . [the filing of a statutory disclaimer disclaiming all claims corresponding to a count] by the patentee could have no other conceivable effect, the proposed rule should be changed to require judgment when all corresponding claims are disclaimed." The suggestion has been adopted and appropriate changes have been made to §1.662(c). In view of the changes, the following language in § 1.662(c), as proposed, is not necessary: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." When a patentee disclaims less than all claims corresponding to a count, the claims which remain in the patent continue to be involved in the interference and any patentability or priority issues involving those remaining claims will be involved in the judgment on the merits in the interference.

Two comments suggested that the word "dissolved" in § 1.662(d) be changed to "terminated". This suggestion is being adopted, because § 1.662(d) has been deleted. However, all interferences will be terminated with a "judgment." A change has been made in the language of §1.11(a) to delete any reference to terminating an interference other than by judgment.

One comment suggested that the word "construed" in § 1.662(a) be changed to "treated". This suggestion has been adopted and more clearly states the intent of the PTO. The filing of the various papers mentioned paragraphs (a) and (c) of § 1.662 will result in certain action by the PTO. The word "treated" more appropriately describes the consequences of filing such papers.

One comment suggested that § 1.662(a) "is too sweeping." According to the commentator, a patentee may file a disclaimer because it has "become aware of a statutory bar or cannot afford the expense of an interference." If the patentee becomes aware of a statutory bar, the patentee should call the "bar" to the attention of the PTO or file an appropriate motion under §1.633(a) for judgment if the "bar" applies to the opponent. If a junior party patentee decides that an interference is too expensive and for that reason files a disclaimer, there is no reason why judgment should not be entered in favor of the opponent. The comment also suggested that § 1.662(c) "needs revision" because a patentee may disclaim one claim corresponding to a count, but not another. Section 1.662(c), as revised, takes into account the possibility that less than all claims corresponding to a count may be disclaimed. When some of the patent claims corresponding to a count are disclaimed, the interference proceeds on the basis of the remaining claims which correspond to the count. If all patent claims corresponding to a count are disclaimed, judgment will be entered.

One comment made the following statement regarding the third sentence of § 1.662(a):

> What of abandonment in favor of a CIP [continuation-in-part application]? Would this be construed as [a] request to enter [an] adverse judgment? Language should reflect procedural moves of substituting CIP for abandoned application and/or declaring new interference.

The third sentence of § 1662(a) does not apply to an application which is *not* involved in an interference. If an applicant files a continuation-in-part application and successfully moves (§ 1633(d)) to substitute the continuation-in-part for the application involved in the interference, abandonment of the application originally involved in the interference would have no bearing on the interference. Accordingly, no additional language is needed in § 1.662(a).

Two comments discussing § 1.663 were received. One comment suggested that an explanation of the status of patent claims involved in an adverse judgment should be stated in the rule. This suggestion is not being adopted. The status of patent claims involved in an adverse judgment is stated in 35 U.S.C. 135(a). Another comment suggested that the status of "claims which could have been counts . . . should be made of record." Unless a motion (§ 1.633(c)) to add claims to correspond to counts is filed, no reference will be made in a judgment as to claims "which could have been made counts."

One comment suggested that the language "then owned by either party but" be inserted after "application" in § 1.665. This suggestion is not being adopted. The language "same parties" in § 1.665 is intended to cover a party and any assignee. The suggested language "then owned" would narrow the scope of the rule in a manner not intended by the PTO.

An oral comment at the hearing suggested that § 1.671(e) be changed so that a party would not have to serve copies of affidavits relied upon under § 1.608(b) in those cases where an opponent had already obtained copies of the Rule 608(b) affidavits. This suggestion is not being adopted. See the discussion above answering comments related to § 1.612(b). Another comment made at the hearing noted that the PTO is "adopting" the Federal Rules of Evidence. The Federal Rules include a "shop book" rule—Rule 803(b)(6). The commentator expressed the view that adopting of a "shop book" rule might make an important change in evidence which is admissible in interferences and suggested that "it would be helpful if the Patent and Trademark Office would publicly comment on this extremely important evidentiary rule. . . ." The PTO believes that adoption of Rule 803(b)(6) of the Federal Rules of Evidence does not constitute a change in the admissibility of "shop book" evidence in interference cases. Rule 803(b)(6) is very similar to the former Federal Shop Book Rule (28 U.S.C. 1732) which it replaced. The courts have articulated a rule of law which the PTO will continue to apply in determining admissibility of laboratory note books under the "shop book" Rule 803(b)(6) of the Federal Rules of Evidence. See e.g., *Alpert* v. *Slatin*, 305 F.2d 891, 134 USPQ 296 (CCPA 1962) and *Elliott* v. *Barker*, 481 F.2d 1337, 179 USPQ 100 (CCPA 1973).

One comment suggested that § 1.671(f) be eliminated on the ground that a rule should not be used to train attorneys and agents. The suggestion is not being adopted. The problem addressed by § 1.671(f) is significant. By providing in the rules that documentary evidence must be explained, the PTO hopes to save both parties and the Board considerable difficulty in presenting and evaluating evidence.

One comment suggested that § 1.671(g) should be changed to require a party only to show the "relevancy" of expected testimony as opposed to the "admissibility" of the testimony. This suggestion is being adopted and an

appropriate change has been made to § 1.671(g) to require a moving party to "describe the general nature and the relevance of the testimony, document, or thing."

An oral comment was received which asked whether permission to issue a subpoena would be needed in the event a party seeks to call a witness under the control of an opponent. Ordinarily, the examiner-in-chief can order a party to produce an individual for a deposition as long as the individual is a party or is under the control of the party, e.g., an employee of an assignee. Where so-called "third parties" are concerned, however, issuance of a subpoena may be necessary, because the PTO has no authority to compel attendance of third parties.

Several comments concerning § 1.672 were received. One comment at the hearing pointed out that use of 8½ by 11 inch paper for affidavits appears to be optional. The commentator is correct in pointing out that the use is optional. By using 8½ by 11 inch paper, however, a party will save considerable time when filing a record (§ 1.653).

Two comments asked questions concerning § 1.672(b), and in particular, the meaning of the word "party" in the phrase "a party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits. . . ." Specifically, one commentator stated:

> It is the scope of the words "the party" which leave doubt as to the meaning of the passage. If "the party" refers *only* to the party proffering the affidavit testimony, then the passage is fair since such party had the opportunity to use whatever documents it deemed favorable to its position. But if "the party" also encompasses the opponent, i.e., the cross-examining party not proffering the affidavit testimony, then the passage improperly restricts the scope of cross-examination. Surely, the proponent party cannot, simply by confining the affidavit to favorable documents, insulate the witness from cross-examination on unfavorable documents.

Section 1.672(b) refers to a "party" and an "opponent." The "party" is the party filing the affidavit and not an opponent of that party. Any "opponent" conducting cross-examination of an affiant may properly rely on documents and things not referred to in the affidavit.

One comment suggested that the language "a witness whose testimony will not be compelled under 35 U.S.C. 24" should be deleted or revised. According to the commentator:

> This is often not determinable in advance. Even a "voluntary" witness may develop cold feet and require a subpoena, or demand one for his own protection. Nor will all witnesses agreeable to affidavits be agreeable to depositions.

The suggestion is not being adopted. An affidavit may be used only when a witness agrees to sign the affidavit. If an individual refuses to sign an affidavit or voluntarily appear at a deposition, the party calling the witness will have to compel attendance at a deposition by a subpoena under 35 U.S.C. 24 after receiving permission from an examiner-in-chief.

One comment asked why there is "no express provision * * * [in the rules] for simply taking appropriate testimony of an adverse party by notice * * * rather than requiring a subpoena?" In many cases, notice will be sufficient inasmuch as an examiner-in-chief or the Board may generally order an adverse party to appear and give testimony. Thus, in many cases a subpoena is not needed to require attendance at a deposition of an adverse party.

Two comments suggested that a time be set out in the rules by which an affidavit should be filed. The suggestion is being adopted and the second sentence of § 1.672(b) has been changed to provide that affidavits shall be filed prior to the close of the party's relevant testimony period. The two comments also suggested that the rules specify that documents relied upon in an affidavit be filed with the affidavit. This suggestion is also being adopted by an appropriate change to § 1.672(b) which will provide that a party cannot rely on any document referred to in an affidavit unless a copy of the document is filed with the affidavit. Any document filed with an affidavit must also be served (§ 1.646). Section 1.672(b) will also provide that a party may not rely on any "thing" mentioned in an affidavit unless the opponent is given reasonable access to the "thing." A "thing" is something other than a document. The comments has suggested that the "things' be limited to those under the possession, custody, or control of the party submitting the affidavit. This suggestion is not being adopted. If a "thing" is not under the possession, custody, or control of a party, the party should resort the use of a deposition and compel production of the "thing" by a subpoena under 35 U.S.C. 24.

Four comments were received discussing § 1.673. It was suggested that the time for service under § 1.673(b) be three days if service is accomplished by hand or "Express Mail" and ten days if service is accomplished by any other means. This suggestion is being adopted. An appropriate change has been made in the introductory sentence of § 1.673(b). It was also suggested that the word "copy" in § 1.673(b) (1) be changed to read "list and copy". In support of the suggestion, one commentator states:

> In connection with the service of documents, the amendment to the proposed rule would require that a listing of documents accompany the documents themselves. This would permit cross-checking between lists and documents to ascertain whether or not discrepancies exists and reduce the possibility for later controversy:

The suggestion is being adopted. Under § 1.673(b) (1) a list of the documents would have to accompany the documents. One comment suggested that documents served should be "Bates numbered." While this suggestion is not being adopted in the sense of changing the language of a rule, it must be remembered that the party serving documents may be required to later prove exactly what was served. Using "Bates" numbers or an equivalent scheme may prove invaluable in later stages of an interference.

One comment discussing § 1.682 suggested that the language "not identified on the record during the taking of testimony of a witness" be deleted. This suggestion is not being adopted. If an official record or printed publication is made an exhibit during a deposition or in an affidavit, it need not be submitted under § 1.682. Section 1.682 permits a party to make an official record or printed publication part of the evidence being considered at final hearing without calling a witness. The official record or printed publication must, however, be self-authenticating. On the other hand, a party may present the official record or printed publication as an exhibit during testimony. When this latter course is followed, there is no need to take advantage of the provisions of § 1.682. The comment also suggested that a change be made in § 1.682(a) (4) because the requirement therein for a "certified" copy appeared to be inconsistent with § 1.671(d) which provides that a record of the PTO need not be certified. The suggestion is being adopted by adding "where approporiate" at the beginning of § 1.682(a) (4) and a reference to § 1.671(d) at the end of § 1.682(a) (4). If the official record is not a record of the PTO, it will be necessary to submit a certified copy of the official record.

Comments were received discussing § 1.684. One comment suggested that language be inserted in § 1.684(a) to make clear that the testimony authorized is for a case-in-chief or a case-in-rebuttal. The suggestion is not being adopted. The testimony authorized by § 1.684(a) is necessarily testimony for a case-in-chief or a case-

in-rebuttal. The commentator correctly notes that the use of written interrogatories under § 1.684 "for cross-examination would seem neither appropriate or justified." Section 1.684 does not apply to cross-examination. If a party submits an affidavit under § 1.672(b) or intends to rely on an affidavit under § 1.617(e), the party must make the affiant available for cross-examination at a deposition. See § 1.673(e). A deposition may be noticed only "for a reasonable time and place in the United States." See § 1.673(a). Accordingly it is not expected that § 1.684(a) will be used to cross-examine affiants residing in foreign countries. The party filing the affidavit will be required to make the affiant available for cross-examination in the United States.

One comment suggested that the provisions of § 1.685(d) are "harsher" than the corresponding provisions of 37 CFR 1.285(c). The comment is not fully understood. Section 1.685(d) requires an objection to be stated on the record. An objection to the admissibility of evidence must be stated on the record *and* a motion under § 1.656(h) renewing the objection at final hearing must be filed. No longer will a party be permitted to attend a deposition and fail to enter an objection only to raise the objection at final hearing. The current practice permits a party to delay the objection until it is often too late to permit an opponent to correct the evidentiary basis on which the objection is bottomed.

One comment suggested that the second sentence of § 1.687(b) ("If the witness refuses to produce a requested document or thing, the party may file a motion (§1.635) for additional discovery under paragraph (c) of this section.") be deleted. This suggestion is being adopted. the PTO agrees with the following remark by the commentator: "[o]mission of the sentence is recommended since it is clear from [paragraph] (c) [of § 1.687] that such a motion could be made in an appropriate case."

One comment at the hearing suggested that the PTO's inability to enter protective orders makes discovery unduly complicated. The commentator suggested that under § 1.687(c), as set out in the notice of proposed rulemaking, it is possible to obtain appropriate protective orders. The commentator correctly concedes that the maximum sanction which the PTO can enter upon a proven violation of a PTO entered protective order is judgment. See § 1.616. The commentator suggested, however, that additional discovery may be conditioned on the issuance of a subpoena *duces tecum* under 35 U.S.C. 24. Upon issuance of the subpoena, the commentator stated that the opponent could move the district court for entry of a protective order. If a party violates a protective order entered by a district court, the party would be subject to such sanctions as the district court might deem appropriate as well as a sanction by the PTO, including entry of judgment against the party. The PTO, unlike the district court, would not be able to apply a sanction after an interference is terminated.

The Commentator's suggestion is believed to be sound. No change in the language of §1.687(b) is believed to be necessary inasmuch as paragraph (b) authorizes the PTO to "specify the terms of conditions of such additional discovery." One of those terms could be requiring a party to issue a subpoena under 35 U.S.C. 24. By making a party proceed in the first instance in the PTO, appropriate PTO orders may be entered suggesting the scope of any protective order and stating the underlying basis for requiring a party to produce documents. The order could be of assistance to the district court in subsequent enforcement or contempt proceedings.

Additional discovery obtained under a protective order issued by either the PTO or a district court will not be admitted in evidence in the PTO in determining the interference. All evidence submitted in an interference must be made available to the public under the provisions of § 1.11(a). Accordingly, any protective orders have to be vacated before a document could be admitted in evidence in the PTO which is subject to a protective order.

Example 38 illustrates how the practice would work.

Example 38. An interference involves party X and party Y. During the interference, party X files a motion for additional discovery under § 1.687(c) asking that party Y be required to produce certain documents. Party Y opposes on the sole ground that the documents contain trade secret and confidential information. Party Y indicates that it has no objection to producing the documents for inspection by counsel for party X, but insists that party X not be permitted to inspect the documents. Accordingly, party Y asks the examiner-in-chief to authorize the discovery subject to entry of a protective order. Party Y argues, however, that the sanctions of § 1.616 are not sufficient in the event of a violation of the protective order. An examiner-in-chief concludes that additional discovery should be ordered, that a protective order is appropriate, and that the sanctions of § 1.616 are not sufficient in the event of a violation of the protective order. Under the circumstances, the examiner-in-chief would enter an order directing party Y to produce the documents for inspection by counsel of party X on the condition that party X seek production of the documents by a subpoena *duces tecum* under 35 U.S.C. 24. Upon issuance of any subpoena, party Y could move the district court for entry of a protective order. If the district court enters the protective order, party Y can produce the documents to counsel for party X. If the protective order of the examiner-in-chief is violated, an appropriate sanction up to and including judgment may be entered by the Board. In addition, party Y would be in a position to seek contempt or other sanctions in the district court. The documents produced for inspection by counsel for party X could not be admitted in evidence in the interference (until the protective order is vacated), because those documents are not documents which can be made available to the public under § 1.11(a).

The following is an anticipated time schedule for a two-party interference:

Event in interference	Time from last event in the interference (month)	Total time in interference (month)
Interference declared (1.611)		
Filing of preliminary statements (1.621) and preliminary motions (1.633)	3	3
Filing oppositions to preliminary motions (1.638(a))	⅝	3⅝
Filing replies to oppositions (1.638(b))	⅝	4⅛
Decision on preliminary motions (1.640 (b)(1)), open preliminary statements (1.631), set times for filing motions for discovery (1.687 (c) and testimony (1.651(a))	1	5⅛
Filing of motions for discovery (1.635, 1.651(a), 1.687(c))	1	6⅛
Filing of opposition to motion for discovery (1.638(a))	⅝	7
Filing reply to opposition to motion for discovery (1.638(b))	⅝	7⅝
Decision on motion for discovery	⅝	8⅛
Time for compliance with any discovery	⅝	9
Junior party testimony (case-in-chief, 1.672(b)):		
Testimony	2	11
Senior party cross-examination of affiants if needed	1	12
Senior party testimony (case-in-chief and case-in-rebuttal, 1.672(b)):		
Testimony	2	13⅛
Junior party cross-examination of affiants if needed	1	14⅛
Junior party testimony (case-in-rebuttal):		
Testimony	⅝	16
Senior party cross-examination of affiants if needed	⅝	16⅝
Filing of record (1.653(c))	1⅛	18
Brief for junior party (1.656)	1	19
Brief for senior party (1.656)	1	20
Reply brief for junior party (1.656)	⅝	20⅝
Final hearing (1.654)	1	21⅝
Decision (1.658)	2	23⅝

The following is an index for §§ 1.601 through 1.688:

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The following is a table correlating the present rules (37 CFR 1.201 through 1.288) to the rules (37 CFR 1.601 through 1.688).

RULE CORRELATION TABLE

Old	New
1.201(a)	1.601(a).
1.201(b)	1.601 (b), (c).
1.201(c)	1.602.
1.202	None.
1.203(a)	1.603 (a), (b).
1.203(b)	1.605(a).
1.203(c)	1.605(b).
New	1.604(a).
1.203(d)	1.604(b).
1.204(a)	None.
1.204(b)	1.608(b).
1.204(c)	1.608(c).

RULE CORRELATION TABLE—Continued

Old	New
1.205(a)	1.606 (a), (b).
1.205(b)	1.607 (a), (c).
1.205(c)	1.607(d).
New	1.608(a).
1.206(a)	1.607(b).
1.207(a)	1.609.
New	1.610.
1.207(b)	1.611.
1.208	1.613.
1.211	1.614.
1.212	1.615.
New	1.616.
1.220	1.617.
New	1.618.
1.215(a)	1.621(a).
1.215(b)	1.621(b).
1.215(c)	1.629(c).
1.216(a)	1.622 (a), (b).
1.216(a) (1)–(6)	1.623(a).
1.216(b)	1.623(b), 1.624(b), 1.625(b).
1.216(c)	1.666.
1.217(a)	1.624(a), 1.625(a).
1.217(b)	1.623(a).
1.218	1.621(a).
1.219	1.627.
1.222	1.628.
1.223	1.629.
1.224	1.630.
1.225	1.640 (d), (e), and 1.651(c)(4).
1.226	1.612.
1.227	1.631.
New	1.632.
1.231	1.633, 1.634.
1.237	1.641.
1.238	1.642.
1.242	1.643.
1.243	1.635, 1.636, 1.637(b), 1.638 through 1.640.
1.244	1.644.
1.245	1.645.
1.246	1.645.
1.247	1.646.
1.248	1.646.
New	1.647.
1.251	1.651.
1.252	1.652.
1.253	1.653.
1.254	1.656.
1.255	1.656(c).
1.256	1.654.
1.257(a)	1.657.
1.257(b)	1.658 (c), (d).
1.258	1.655.
1.259	1.659.
New	1.660.
1.262	1.662(a).
1.263	1.662 (a) and (d).
1.264	1.662 (b) and (c).
New	1.662(e).
1.265	1.663.
1.266	1.664.
1.267	1.665.
1.268	1.666.
1.271	1.671.
New	1.671(g).
1.272(a)	1.672 (a), (b).
1.272(b)	1.672(c).
1.272(c)	1.672 (d), (e).
1.273(a)	1.673 (a), (c), (d).
New	1.673(e).
1.273(b)	1.673(f).
1.274	1.674.
1.275	1.675.
1.276	1.676.
1.277	1.677.
1.278	1.678.
1.279	1.679.
1.281	1.645.
1.282	1.682.
1.283	1.683.
1.285	1.685.
1.286	Eliminated.
1.287(a)(1)(i), (ii)	1.673(b).
1.287(a)(1)(iii)	1.673(a).
1.287(a)(2), (3)	Eliminated.
1.287(b)	Eliminated.
1.287(c)	1.687.
1.287(d)(1)	1.673(c).
1.287(d)(2)	1.616
1.287(e)	1.687(d).
1.288	1.688.

Other Considerations

These rules do not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rules are in conformity with the requirements of the (1) Regulatory Flexibility Act (Pub. L. 96–354), (2) Executive Order 12291, and (3) the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that these rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act; Pub. L. 96–354). The rules govern the conduct of interference cases which arise in the Patent and Trademark Office. In fiscal 1983, the Patent and Trademark Office received 105,704 patent applications. During the same period, 180 interferences were declared. It is expected that the overall cost will be reduced for obtaining a patent based on applications which become involved in an interference. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H.R. 6286 on the floor of the House in which the following statement appears (130 Cong. Rec. H10528, columns 2 and 3):

> It is expected that interferences will become simpler, more expeditious, and less costly. Under the bill, all issues of patentability and priority which arise in an interference can be decided in a single proceeding rather than in a series of complicated *inter parte* and *ex parte* proceedings.

These rules, therefore, will have no significant economic impact on small entities.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy would be less than $100 million. There would be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There would be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

These rules do not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Lawyers.

PART 1—RULES OF PRACTICE IN PATENT CASES

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 23, 41, and 135, Part 1 of Title 37 CFR is amended as set forth below.

1. Section 1.1 is amended by adding a new paragraph (e) to read as follows:

§ 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(e) Communications relating to interferences and applications or patents involved in an interference should be additionally marked "BOX INTERFERENCE."

2. Section 1.4 is amended by revising paragraph (a)(2) and reprinting the introductory text of paragraph (a) to read as follows:

§ 1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises:

* * * * *

(2) Correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.352; of international applications in Subpart C, §§ 1.401 to 1.482; of reexamination of patents in Subpart D, §§ 1.501 to 1.570; of interferences in Subpart E, §§ 1.601 to 1.688; and of trademark applications §§ 2.11 to 2.189.

* * * * *

3. Section 1.5 is amended by adding a new paragraph (e) to read as follows:

§ 1.5 Identification of application, patent or registration.

* * * * *

(e) When a paper concerns an interference, it should state the names of the parties and the number of the interference. The name of the examiner-in-chief assigned to the interference (§ 1.610) and the name of the party filing the paper should appear conspicuously on the first page of the paper.

4. Section 1.8 is amended by adding paragraph (a)(xii) to read as follows:

§ 1.8 Certificate of mailing.

* * * * *

(xii) The filing of a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail."

* * * * *

5. Section 1.9 is amended by adding a new paragraph (g) to read as follows:

§ 1.9 Definitions.

* * * * *

(g) For definitions in interferences see § 1.601.

6. Section 1.11 is amended by revising paragraph (a) to read as follows:

§ 1.11 Files open to the public.

(a) After a patent has been issued, the specification, drawings and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained upon paying the fee therefor. After entry of a judgment in an interference by the Board of Patent Appeals and Interferences as to all parties, the file of any interference which involved a patent, or an application on which a patent has issued, is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

* * * * *

§ 1.14 [Amended]

7. Section 1.14 is amended by removing from paragraph (d) the words "Board of Patent Appeals or the Board of Patent Interferences" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

8. Section 1.17 is amended by revising paragraphs (e), (g), (h), and (i) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f))	$57.50
By other than a small entity	115.00

* * * * *

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f))	$50.00
By other than a small entity	100.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph, $120.00.

§ 1.47—for filing by other than all the inventors or a person not the inventor.

§ 1.48—for correction of inventorship.

§ 1.182—for decision on questions not specifically provided for.
§ 1.183—to suspend the rules.
§ 1.377—for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.
§ 1.378(e)—for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.
§ 1.644(e)—for petition in an interference.
§ 1.644(f)—for request for reconsideration of a decision on petition in an interference.
§ 1.666(c)—for late filing of interference settlement agreement.
§§ 5.12, 5.13 & 5.14—for expedited handling of foreign filing license.
§ 5.15—for changing the scope of a license.
§ 5.25—for retroactive license.

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph, $60.00.

§ 1.12—for access to an assignment record.
§ 1.14—for access to an application.
§ 1.55—for entry of late priority papers.
§ 1.102—to make application special.
§ 1.103—to suspend action in application.
§ 1.177—for divisional reissues to issue separately.
§ 1.312—for amendment after payment of issue fee.
§ 1.313—to withdraw an application from issue.
§ 1.314—to defer issuance of a patent.
§ 1.334—for patent to issue to assignee, assignment recorded late.
§ 1.666(b)—for access to interference settlement agreement.

* * * * *

9. Section 1.36 is revised as follows:

§ 1.36 Revocation of power of attorney or authorization; withdrawal of attorney or agent.

A power of attorney or authorization of agent may be revoked at any stage in the proceedings of a case, and an attorney or agent may withdraw, upon application to and approval by the Commissioner. An attorney or agent, except an associate attorney or agent whose address is the same as that of the principal attorney or agent, will be notified of the revocation of the power of attorney or authorization, and the applicant or patent owner will be notified of the withdrawal of the attorney or agent. An assignment will not of itself operate as a revocation of a power or authorization previously given, but the assignee of the entire interest may revoke previous powers and be represented by an attorney or agent of the assignee's own selection. See § 1.613(d) for withdrawal of an attorney or agent of record in an interference.

10. Section 1.48 is revised as follows:

§ 1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by (a) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (b) an oath or declaration by each actual inventor or inventors as required by § 1.63; (c) the fee set forth in § 1.17(h); and (d) the written consent of any assignee. When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

§ 1.55 [Amended]

11. Section 1.55 is amended by removing from paragraph (a) "1.224" and inserting, in its place, "1.630".

12. Section 1.59 is revised as follows:

§ 1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to § 1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the requried basic filing fee (§ 1.16) or the processing and retention fee (§ 1.21(1)) has been paid. See § 1.618 for return of unauthorized and improper papers in interferences.

13. Section 1.68 is revised as follows:

§ 1.68 Declaration in lieu of oath.

Any document to be filed in the Patent and Trademark Office and which is required by any law, rule, or other regulation to be under oath may be subscribed to by a written declaration. Such declaration may be used in lieu of the oath otherwise required, if, and only if, the declarant is on the same document, warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon. The declarant must set forth in the body of the declaration that all statements made of the declarant's own knowledge are true and that all statements made on information and belief are believed to be true.

14. Section 1.103 is amended by revising paragraph (d) as follows:

§ 1.103 Suspension of action.

* * * * *

(d) Action on applications in which the Office has accepted a request filed under § 1.139 will be suspended for the entire pendency of these applications except for purposes relating to interference proceedings under §§ 1.601 through 1.688.

15. Section 1.122 is amended by revising paragraph (b) as follows:

§ 1.122 Entry and consideration of amendments.

* * * * *

(b) Ordinarily all amendments presented in a paper filed while the application is open to amendment are entered and considered, subsequent cancellation or correction being required of improper amendments. Untimely amendatory papers may be refused entry and consideration in whole or in part. For amendments presented during an interference see § 1.664.

§ 1.136 [Amended]

16. Section 1.136 is amended by removing "§ 1.207" and inserting, in its place, "§ 1.611" and by removing "§ 1.245" and inserting, in its place, "§ 1.645".

17. Section 1.138 is revised as follows:

§ 1.138 Express Abandonment.

An application may be expressly abandoned by filing in the Patent and Trademark Office a written declaration of abandonment signed by the applicant and the assignee of record, if any, and identifying the application. An application may also be expressly abandoned by filing a written declaration of abandonment signed by the attorney or agent of record. A registered attorney or agent acting under the provision of § 1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application. Express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue.

18. Section 1.181 is amended by revising paragraph (a) as follows:

§ 1.181 Petition to the Commissioner.

(a) Petition may be taken to the Commissioner: (1) From any action or requirement of any examiner in the *ex parte* prosecution of an application which is not subject to appeal to the Board of Patent Appeals and Interferences or to the court; (2) in cases in which a statute or the rules specify that the matter is to be determined directly by or reviewed by the

Commissioner; and (3) to invoke the supervisory authority of the Commissioner in appropriate circumstances. For petitions in interferences, see § 1.644.

* * * * *

19. The center heading preceding § 1.191 is revised to read:

Appeal to the Board of Patent Appeals and Interferences

20. Section 1.191 is amended by revising the section heading and paragraphs (a) and (c) as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination, any of the claims of which have been twice rejected or who has been given a final rejection (§ 1.113), may, upon the payment of the fee set forth in § 1.17(e), appeal from the decision of the examiner to the Board of Patent Appeals and Interferences within the time allowed for response.

* * * * *

(c) An appeal when taken must be taken from the rejection of all claims under rejection which the applicant or patent owner proposes to contest. Questions relating to matters not affecting the merits of the invention may be required to be settled before an appeal can be considered.

* * * * *

§ 1.194 [Amended]

21. Section 1.194 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

22. Section 1.196 is revised as follows:

§ 1.196 Decision by the Board of Patent Appeals and Interferences.

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. When the Board of Patent Appeals and Interferences make a new rejection of an appealed claim, the appellant may exercise any one of the following three options:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner and the decision of the Board of Patent Appeals and Interferences shall not be considered final for the purpose of judicial review. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused.

(3) The appellant may treat the decision, including the new grounds for rejection given by the Board of Patent Appeals and Interferences, as a final decision in the case.

(c) Should the decision of the Board of Patent Appeals and Interferences include an explicit statement that a claim may be allowed in amended form, appellant shall have the right to amend in conformity with such statement which shall be binding on the examiner in the absence of new references or grounds of rejection.

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences. Whenever a decision of the Board of Patent Appeals and Interferences includes a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

23. Section 1.197 is amended by revising paragraphs (a) and (b) as follows:

§ 1.197 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the case shall be returned to the examiner, subject to the appellant's right of appeal or other review, for such further action by the appellant or by the examiner, as the condition of the case may require, to carry into effect the decision.

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states.

* * * * *

§ 1.198 [Amended]

24. Section 1.198 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

25. The center heading preceding § 1.201 is removed.

§§ 1.201 through 1.212 [Removed]

26. Sections 1.201 through 1.212 are removed.

27. The center heading preceding § 1.215 is removed.

§§ 1.215 through 1.228 [Removed]

28. Sections 1.215 through 1.228 are removed.

29. The center heading preceding § 1.231 is removed.

§§ 1.231 through 1.238 [Removed]

30. Sections 1.231 through 1.238 are removed.

31. The center heading preceding § 1.242 is removed.

§§ 1.242 through 1.247 [Removed]

32. Sections 1.242 through 1.247 are removed.

33. A center heading preceding § 1.248 is added which reads:

Miscellaneous Provisions

34. Section 1.248 is amended by adding paragraph (c) and revising the section heading as follows:

§ 1.248 Service of Papers; manner of service; proof of service in cases other than interferences.

* * * * *

(c) See § 1.646 for service of papers in interferences.

35. The center heading preceding § 1.251 is removed.

§§ 1.251 through 1.259 [Removed]

36. Sections 1.251 through 1.259 are removed.

37. The center heading preceding § 1.261 is removed.

§§ 1.261 through 1.268 [Removed]

38. Sections 1.261 through 1.268 are removed.

39. The center heading preceding § 1.271 is removed.

§§ 1.271 through 1.288 [Removed]

40. Sections 1.271 through 1.288 are removed.

41. Section 1.292 is amended by revising paragraph (a) and adding paragraph (c) as follows:

§1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations and the fee set forth in § 1.17(j) is filed by one having information of the pendency of an application and is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§ 1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

* * * * *

(c) A petition for institution of public use proceedings shall not be filed by a party to an interference as to an application involved in the interference. Public use and on sale issues in an interference shall be raised by a preliminary motion under § 1.633(a).

§ 1.301 [Amended]

42. Section 1.301 is amended by removing the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences."

§ 1.302 [Amended]

43. Section 1.302 is amended by removing from paragraph (b) "1.248" and inserting, in its place, "1.646" and by removing "and other contested cases".

§ 1.303 [Amended]

44. Section 1.303 is amended by removing from paragraph (a) the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences" and by removing from paragraph (c) "1.248" and inserting, in its place, "1.646".

45. Section 1.304 is amended by revising paragraph (a) as follows:

§ 1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is sixty days from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of § 1.136. See § 1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See § 1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

* * * * *

46. Section 1.322 is amended by revising paragraph (a) as follows:

§ 1.322 Certificate of correction of Office mistake.

(a) A certificate of correction under 35 U.S.C. 254 may be issued at the request of the patentee or the patentee's assignee. Such certificate will not be issued at the request or suggestion of anyone not owning an interest in the patent, nor on motion of the Office, without first notifying the patentee (including any assignee of record) and affording the patentee an opportunity to be heard. When the request relates to a patent involved in an interference, the request shall comply with the requirements of this section and shall be accompanied by a motion under § 1.635.

* * * * *

47. Section 1.323 is revised as follows:

§ 1.323 Certificate of correction of applicant's mistake.

Whenever a mistake of a clerical or typographical nature or of minor character which was not the fault of the Office, appears in a patent and a showing is made that such mistake occurred in good faith, the Commissioner may, upon payment of the fee set forth in § 1.20(a), issue a certificate, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. A request for a certificate of correction of a patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under § 1.635.

48. Section 1.324 is revised as follows:

§ 1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in § 1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors. A request to correct inventorship of patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

§ 1.550 [Amended]

49. Section 1.550 is amended by removing from paragraph (a) "Board of Appeals" and inserting, in its place, "Board of Patent Appeals and Interferences."

50. Section 1.565 is amended by revising paragraph (b) and adding paragraph (e) as follows:

§ 1.565 Concurrent office proceedings.

* * * * *

(b) If a patent in the process of reexamination is or becomes involved in litigation or a reissue application for the patent in filed or pending, the Commissioner shall determine whether or not to stay the reexamination or reissue proceeding.

* * * * *

(e) If a patent in the process of reexamination is or becomes involved in an interference, the Commissioner may stay reexamination or the interference. The Commissioner will not consider a request to stay an interference unless a motion (§ 1.635) to stay the interference has been presented to, and denied by, an examiner-in-chief and the request is filed within ten (10) days of a decision by an examiner-in-chief denying the motion for a stay or such other time as the examiner-in-chief may set.

51. A new subpart entitled "Subpart E—Interferences" is added which reads as follows:

Subpart E—Interferences

Sec.

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1.603 Interference between applications; subject matter of the interference.
1.604 Request for interference between applications by an applicant.
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Authority: 35 U.S.C. 6, 23, 41, and 135.

Subpart E—Interferences

§ 1.601 Scope of rules, definitions.

This subpart governs the procedure in patent interferences in the Patent and Trademark Office. This subpart shall be construed to secure the just, speedy, and inexpensive determination of every interference. For the meaning of terms in the Federal Rules of Evidence as applied to interferences, see § 1.671(c). Unless otherwise clear from the context, the following definitions apply to this subpart:

(a) "Additional discovery" is discovery to which a party may be entitled under § 1.687 in addition to discovery to which the party is entitled as a matter of right under § 1.673 (a) and (b).

(b) "Affidavit" means affidavit, declaration under § 1.68, or statutory declaration under 28 U.S.C. 1746. A transcript of an *ex parte* deposition may be used as an affidavit.

(c) "Board" means the Board of Patent Appeals and Interferences.

(d) "Case-in-chief" means that portion of a party's case where the party has the burden of going forward with evidence.

(e) "Case-in-rebuttal" means that portion of a party's case where the party presents evidence in rebuttal to the case-in-chief of another party.

(f) A "count" defines the interfering subject matter between (1) two or more applications or (2) one or more applications and one or more patents. When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent which corresponds to a count is a claim involved in the interference within the meaning of 35 U.S.C. 135(a). A claim of a patent or application which is identical to a count is said to "correspond exactly" to the count. A claim of a patent or application

which is not identical to a count, but which defines the same patentable invention as the count, is said to "correspond substantially" to the count. When a count is broader in scope than all claims which correspond to the count, the count is a "phantom count." A phantom count is not patentable to any party.

(g) The "effective filing date" of an application or a patent is the filing date of an earlier application accorded to the application or patent under 35 U.S.C. 119, 120, or 365.

(h) In the case of an application, "filing date" means the filing date assigned to the application. In the case of a patent, "filing date" means the filing date assigned to the application which issued as the patent.

(i) An "interference" is a proceeding instituted in the Patent and Trademark Office before the Board to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patents contain claims for the same patentable invention.

(j) An "interference-in-fact" exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count define the same patentable invention.

(k) A "lead" attorney or agent is a registered attorney or agent of record who is primarily responsible for prosecuting and interference on behalf of a party and is the attorney or agent whom an examiner-in-chief may contact to set times and take other action in the interference.

(l) A "party" is (1) an applicant or patentee involved in the interference or (2) a legal representative or an assignee of an applicant or patentee involved in an interference. Where acts of a party are normally performed by an attorney or agent, "party" may be construed to mean the attorney or agent. An "inventor" is the individual named as inventor in an application involved in an interference or the individual named as inventor in a patent involved in an interference.

(m) A "senior party" is the party with earliest effective filing date as to all counts or, if there is no party with the earliest effective filing date as to all counts, the party with the earliest filing date. A "junior party" is any other party.

(n) Invention "A" is the "same patentable invention" as a invention "B" when invention "A" is the same as (35 U.S.C. 102) or is obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A". Invention "A" is a "separate patentable invention" with respect to invention "B" when invention "A" is new (35 U.S.C 102) and non-obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A".

(o) "Sworn" means sworn or affirmed.

(p) "United States" means the United States of America, its territories and possessions.

§ 1.602 Interest in applications and patents involved in an interference.

(a) Unless good cause is shown, an interference shall not be declared or continued between (1) applications owned by a single party or (2) applications and an unexpired patent owned by a single party.

(b) The parties, within 20 days after an interference is declared, shall notify the Board of any and all right, title, and interest in any application or patent involved or relied upon in the interference unless the right, title, and interest is set forth in the notice declaring the interference.

(c) If a change of any right, title, and interest in any application or patent involved or relied upon in the interference occurs after notice is given declaring the interference and before the time expires for seeking judicial review of a final decision of the Board, the parties shall notify the Board of the change within 20 days of the change.

§ 1.603 Interference between applications; subject matter of the interference.

Before an interference is declared between two or more applications, the examiner must be of the opinion that there is interfering subject matter claimed in the applications which is patentable to each applicant subject to a judgment in the interference. The interfering subject matter shall be defined by one or more counts. Each count shall define a separate patentable invention. Each application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the applications which define the same patentable invention as a count shall be designated to correspond to the count.

§ 1.604 Request for interference between applications by an applicant.

(a) An applicant may seek to have an interference declared with an application of another by (1) suggesting a proposed count and presenting a claim corresponding to the proposed count, (2) identifying the other application and, if known, a claim in the other application which corresponds to the proposed count, and (3) explaining why an interference should be declared.

(b) When an applicant presents a claim known to the applicant to define the same patentable invention claimed in a pending application of another, the applicant shall identify that pending application, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where it appears an applicant may have failed to comply with the provisions of this paragraph.

§ 1.605 Suggestion of claim to applicant by examiner.

(a) The examiner may suggest that an applicant present a claim in an application for the purpose of an interference with another application or a patent. The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim within a time specified by the examiner, not less than one month. Failure or refusal of an applicant to timely present the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim. At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

(b) The suggestion of a claim by the examiner for the purpose of an interference will not stay the period for response to any outstanding Office action. When a suggested claim is timely presented, *ex parte* proceedings in the application will be stayed pending a determination of whether an interference will be declared.

§ 1.606 Interference between an application and a patent; subject matter of the interference.

Before an interference is declared between an application and an unexpired patent, an examiner must determine that there is interfering subject matter claimed in the

application and the patent which is patentable to the applicant subject to a judgment in the interference. The interfering subject matter will be defined by one or more counts. Each count shall define a separate patentable invention. Any application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the application and patent which define the same patentable invention as a count shall be designated to correspond to the count. At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than any patent claim which corresponds to the count and any single patent claim will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

§ 1.607 Request by applicant for interference with patent.

(a) An applicant may seek to have an interference declared between an application and an unexpired patent by (1) presenting a proposed count and a claim corresponding to the proposed count and, if any claim of the patent or application does not correspond exactly to the proposed count, explaining why an interference should be declared, (2) identifying the patent and indicating which claim in the application and which claim or claims of the patent correspond to the proposed count, and (3) applying the terms of the application claim corresponding to the count to the disclosure of the application.

(b) When an applicant seeks an interference with a patent, examination of the application, including any appeal to the Board, shall be conducted with special dispatch within the Patent and Trademark Office. The examiner shall determine whether there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in an interference. If the examiner determines that there is any interfering subject matter, an interference will be declared. If the examiner determines that there is no interfering subject matter, the examiner shall state the reasons why an interference is not being declared and otherwise act on the application.

(c) When an applicant presents a claim which corresponds exactly or substantially to a claim of a patent, the applicant shall identify the patent and the number of the patent claim, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where an applicant fails to identify the patent.

(d) A notice that an applicant is seeking to provoke an interference with a patent will be placed in the file of the patent and a copy of the notice will be sent to the patentee. The identity of the applicant will not be disclosed unless an interference is declared. If a final decision is made not to declare an interference, a notice to that effect will be placed in the patent file and will be sent to the patentee.

§ 1.608 Interference between an application and a patent; prima facie showing by applicant.

(a) When the earlier of the filing date or effective filing date of an application is three months or less after the earlier of the filing date or effective filing date of a patent, the applicant, before an interference will be declared, shall file an affidavit alleging that there is a basis upon which applicant is entitled to a judgment relative to the patentee.

(b) When the earlier of the filing date or the effective filing date of an application is more than three months after the earlier of the filing date or the effective filing date under 35 U.S.C. 120 of a patent, the applicant, before an interference will be declared, shall file (1) evidence which may consist of patents or printed publications, other documents, and one or more affidavits which demonstrate that applicant is *prima facie* entitled to a judgment relative to the patentee and (2) an explanation stating with particularity the basis upon which the applicant is *prima facie* entitled to the judgment. Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To facilitate preparation of a record (§ 1.653 (g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8½ x 11 inches (21.8 by 27.9 cm.). The significance of any printed publication or other document which is self-authenticating within the meaning of Rule 902 of the Federal Rules of Evidence or § 1.671(d) and any patent shall be discussed in an affidavit or the explanation. Any printed publication or other document which is not self-authenticating shall be authenticated and discussed with particularity in an affidavit. Upon a showing of sufficient cause, an affidavit may be based on information and belief. If an examiner finds an application to be in condition for declaration of an interference, the examiner will consider the evidence and explanation only to the extent of determining whether a basis upon which the applicant would be entitled to a judgment relative to the patentee is alleged and, if a basis is alleged, an interference may be declared.

§ 1.609 Preparation of interference papers by examiner.

When the examiner determines that an interference should be declared, the examiner shall forward to the Board:

(a) All relevant application and patent files and

(b) A statement identifying:

(1) The proposed count or counts;

(2) The claims of any application or patent which correspond to each count, stating whether the claims correspond exactly or substantially to each count;

(3) The claims in any application which are deemed by the examiner to be patentable over any count; and

(4) Whether an applicant or patentee is entitled to the benefit of the filing date of an earlier application and, if so, sufficient information to identify the earlier application.

§ 1.610 Assignment of interference to examiner-in-chief, time period for completing interference.

(a) Each interference will be declared by an examiner-in-chief who may enter all interlocutory orders in the interference, except that only a panel consisting of at least three members of the Board shall (1) hear oral argument at final hearing, (2) enter a decision under §§1.617, 1.640(c) or (e), 1.652, 1.656(i) or 1.658 or (3) enter any other order which terminates the interference.

(b) As necessary, another examiner-in-chief may act in place of the one who declared the interference. Unless otherwise provided in this section, at the discretion of the examiner-in-chief assigned to the interference, a panel consisting of two or more members of the Board may enter interlocutory orders.

(c) Unless otherwise provided in this subpart, times for taking action by a party in the interference will be set on a case-by-case basis by the examiner-in-chief assigned to the interference. Times for taking action shall be set and the examiner-in-chief shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.

(d) An examiner-in-chief may hold a conference with the parties to consider: (1) Simplification of any issues, (2) the necessity or desirability of amendments to counts, (3) the possibility of obtaining admissions of fact and genuineness of documents which will avoid unnecessary proof, (4) any limitations on the number of expert witnesses, (5) the time and place for conducting a deposition (§ 1.673(g)), and (6) any other matter as may aid in the disposition of the interference. After a conference, the examiner-in-chief may enter any order which may be appropriate.

(e) The examiner-in-chief may determine a proper course of conduct in an interference for any situation not specifically covered by this part.

§ 1.611 Declaration of interference.

(a) Notice of declaration of an interference will be sent to each party.

(b) When a notice of declaration is returned to the Patent and Trademark Office undelivered, or in any other circumstance where appropriate, an examiner-in-chief may (1) send a copy of the notice to a patentee named in a patent involved in an interference or the patentee's assignee of record in the Patent and Trademark Office or (2) order publication of an appropriate notice in the *Official Gazette*.

(c) The notice of declaration shall specify:

(1) The name and residence of each party involved in the interference;

(2) The name and address of record of any attorney or agent of record in any application or patent involved in the interference;

(3) The name of any assignee of record in the Patent and Trademark Office;

(4) The identity of any application or patent involved in the interference;

(5) Where a party is accorded the benefit of the filing date of an earlier application, the identity of the earlier application;

(6) The count or counts;

(7) The claim or claims of any application or any patent which correspond to each count; and

(8) The order of the parties.

(d) The notice of declaration may also specify the time for: (1) Filing a preliminary statement as provided in § 1.621(a); (2) serving notice that a preliminary statement has been filed as provided § 1.621(b); and (3) filing preliminary motions authorized by § 1.633, oppositions to the motions, and replies to the oppositions.

(e) Notice may be given in the *Official Gazette* that an interference has been declared involving a patent.

§ 1.612 Access to applications.

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under § 1.131 and any evidence and explanation under § 1.608(b) filed separate from an amendment.

(b) After preliminary motions under § 1.633 are decided (§ 1.640(b)), each party shall have access to and may obtain copies of any affidavit filed under § 1.131 and any evidence and explanation filed under § 1.608(b) in any application set out in the notice declaring the interference.

(c) Any evidence and explanation filed under § 1.608(b) in the file of any application identified in the notice declaring the interference shall be served when required by § 1.617(b).

(d) The parties at any time may agree to exchange copies of papers in the files of any application identified in the notice declaring the interference.

§ 1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent.

(a) Each party may be required to designate one attorney or agent of record as the lead attorney or agent.

(b) The same attorney or agent or members of the same firm of attorneys or agents may not represent two or more parties in an interference except as may be permitted under this Chapter.

(c) An examiner-in-chief may make necessary inquiry to determine whether an attorney or agent should be disqualified from representing a party in an interference. If an examiner-in-chief is of the opinion that an attorney or agent should be disqualified, the examiner-in-chief shall refer the matter to the Commissioner. The Commissioner will make a final decision as to whether any attorney or agent should be disqualified.

(d) No attorney or agent of record in an interference may withdraw as attorney or agent of record except with the approval of an examiner-in-chief and after reasonable notice to the party on whose behalf the attorney or agent has appeared. A request to withdraw as attorney or agent of record in an interference shall be made by motion (§ 1.635).

§ 1.614 Jurisdiction over interference.

(a) The Board shall assume jurisdiction over an interference when the interference is declared under § 1.611.

(b) When the interference is declared the interference is a contested case within the meaning of 35 U.S.C. 24.

(c) The examiner shall have jurisdiction over any pending application until the interference is declared. An examiner-in-chief, where appropriate, may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.

§ 1.615 Suspension of ex parte prosecution.

(a) When an interference is declared, ex parte prosecution of an application involved in the interference is suspended. Amendments and other papers related to the application received during pendency of the interference will not be entered or considered in the interference without the consent of an examiner-in-chief.

(b) *Ex parte* prosecution as to specified matters may be continued concurrently with the interference with the consent of the examiner-in-chief.

§ 1.616 Sanctions for failure to comply with rules or order.

An examiner-in-chief or the Board may impose an appropriate sanction against a party who fails to comply with the regulations of this part or any order entered by an examiner-in-chief or the Board. An appropriate sanction may include among others entry of an order:

(a) holding certain facts to have been established in the interference;

(b) precluding a party from filing a motion or a preliminary statement;

(c) precluding a party from presenting or contesting a particular issue;

(d) precluding a party from requesting, obtaining, or opposing discovery; or

(e) granting judgment in the interference.

§ 1.617 Summary judgment against applicant.

(a) An examiner-in-chief shall review any evidence filed by an applicant under § 1.608(b) to determine if the applicant is *prima facie* entitled to a judgment relative to the patentee. If the examiner-in-chief determines that the evidence shows the applicant is *prima facie* entitled to a judgment relative to the patentee, the interference shall proceed in the normal manner under the regulations of this part. If in the opinion of the examiner-in-chief the evidence fails to show that the applicant is *prima facie* entitled to a judgment relative to the patentee, the examiner-in-chief shall, concurrently with the notice declaring the interference, enter an order stating the reasons for the opinion and directing the applicant, within a time set in the

order, to show cause why summary judgment should not be entered against the applicant.

(b) The applicant any file a response to the order and state any reasons why summary judgment should not be entered. Any request by the applicant for a hearing before the Board shall be made in the response. Additional evidence shall not be presented by the applicant or considered by the Board unless the applicant shows good cause why any additional evidence was not initially presented with the evidence filed under § 1.608(b). At the time an applicant files a response, the applicant shall serve a copy of any evidence filed under § 1.608(b) and this paragraph.

(c) If a response is not timely filed by the applicant, the Board shall enter a final decision granting summary judgment against the applicant.

(d) If a response is timely filed by the applicant, all opponents may file a statement within a time set by the examiner-in-chief. The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause. Evidence shall not be filed by any opponent. An opponent may not request an oral hearing.

(e) Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent.

(f) When more than two parties are involved in an interference, all parties may participate in summary judgment proceedings under this section.

(g) If a response by the applicant is timely filed, the examiner-in-chief or the Board shall decide whether the evidence submitted under § 1.608(b) and any additional evidence properly submitted under paragraph (b) of this section shows that the applicant is *prima facie* entitled to a judgment relative to the patentee. If the applicant is not *prima facie* entitled to a judgment relative to the patentee, the Board shall enter a final decision granting summary judgment against the applicant. Otherwise, an interlocutory order shall be entered authorizing the interference to proceed in the normal manner under the regulations of this part.

(h) Only an applicant who filed evidence under § 1.608(b) may request a hearing. If that applicant requests a hearing, the Board may hold a hearing prior to entry of a decision under paragraph (g) of this section. The examiner-in-chief shall set a date and time for the hearing. Unless otherwise ordered by the examiner-in-chief or the Board, the applicant and any opponent will each be entitled to no more than 30 minutes of oral argument at the hearing.

§1.618 Return of unauthorized papers.

(a) The Patent and Trademark Office shall return to a party any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart. Any paper returned will not thereafter be considered by the Patent and Trademark Office in the interference. A party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an examiner-in-chief.

(b) When presenting a paper in an interference, a party shall not submit with the paper a copy of a paper previously filed in the interference.

§ 1.621 Preliminary statement, time for filing, notice of filing.

(a) Within the time set for filing preliminary motions under § 1.633, each party may file a preliminary statement. The preliminary statement may be signed by any individual having knowledge of the facts recited therein or an attorney or agent of record.

(b) When a party files a preliminary statement the party shall also simultaneously file and serve on all opponents in the interference a notice stating that a preliminary statement has been filed. A copy of the preliminary statement need not be served until ordered by an examiner-in-chief.

§ 1.622 Preliminary statement, who made invention, where invention made.

(a) A party's preliminary statement must identify the inventor who made the invention defined by each count and must state on behalf of the inventor the facts required by paragraph (a) of §§ 1.623, 1.624, and 1.625 as may be appropriate. When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion under § 1.634 to correct inventorship.

(b) The preliminary statement shall state whether the invention was made in the United States or abroad. If made abroad, the preliminary statement shall state whether the party is entitled to the benefit of the second sentence of 35 U.S.C. 104.

§ 1.623 Preliminary statement; invention made in United States.

(a) When the invention was made in the United States or a party is entitled to the benefit of the second sentence of 35 U.S.C. 104, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which the first drawing of the invention was made.

(2) The date on which the first written description of the invention was made.

(3) The date on which the invention was first disclosed by the inventor to another person.

(4) The date on which the invention was first conceived by the inventor.

(5) The date on which the invention was first actually reduced to practice. If the invention was not actually reduced to practice by or on behalf of the inventor prior to the party's filing date, the preliminary statement shall so state.

(6) The date after the inventor's conception of the invention when active exercise of reasonable diligence toward reducing the invention to practice began.

(b) If a party intends to prove derivation, the preliminary statement must also comply with § 1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a copy of the first drawing or written description cannot be filed with the preliminary statement.

§ 1.624 Preliminary statement; invention made abroad.

(a) When the invention was made abroad and a party intends to rely on introduction of the invention into the United States, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which a drawing of the invention was first introduced into the United States.

(2) The date on which a written description of the invention was first introduced into the United States.

(3) The date on which the invention was first disclosed to another person in the United States.

(4) The date on which the inventor's conception of the invention was first introduced into the United States.

(5) The date on which an actual reduction to practice of the invention was first introduced into the United States. If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state.

(6) The date after introduction of the inventor's conception into the United

States when active exercise of reasonable diligence in the United States toward reducing the invention to practice began.

(b) If a party intends to prove derivation, the preliminary statement must also comply with § 1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was introduced into the United States a copy of that drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was introduced into the United States a copy of that written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a copy of the first drawing or first written description introduced in the United States cannot be filed with the preliminary statement.

§ 1.625 Preliminary statement; derivation by an opponent.

(a) When the invention was made in the United States or abroad and a party intends to prove derivation by an opponent from the party, the preliminary statement must state the following as to the invention defined by each count:

(1) The name of the opponent.

(2) The date on which the first drawing of the invention was made.

(3) The date on which the first written description of the invention was made.

(4) The date on which the invention was first disclosed by the inventor to another person.

(5) The date on which the invention was first conceived by the inventor.

(6) The date on which the invention was first communicated to the opponent.

(b) If a party intends to prove priority, the preliminary statement must also comply with § 1.623 or § 1.624.

(c) When a party alleges under paragraph (a)(2) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(3) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a first drawing or first written description cannot be filed with the preliminary statement.

§ 1.626 Preliminary statement; earlier application.

When a party does not intend to present evidence to prove a conception or an actual reduction to practice and the party intends to rely solely on the filing date of an earlier application filed in the United States or abroad to prove a constructive reduction to practice, the preliminary statement may so state and identify the earlier application with particularity.

§ 1.627 Preliminary statement, sealing before filing, opening of statement.

(a) The preliminary statement and copies of any drawing or written description shall be filed in a sealed envelope bearing only the name of the party filing the statement and the style (e.g., Jones v. Smith) and number of the interference. The sealed envelope should contain only the preliminary statement and copies of any drawing or written description. If the preliminary statement is filed through the mail, the sealed envelope should be enclosed in an outer envelope addressed to the Commission of Patents and Trademarks in accordance with § 1.1(e).

(b) A preliminary statement may be opened only at the direction of an examiner-in-chief.

§ 1.628 Preliminary statement, correction of error.

(a) A material error arising through inadvertence or mistake in connection with (1) a preliminary statement or (2) drawings or a written description submitted therewith or omitted therefrom, may be corrected by a motion (§ 1.635) for leave to file a corrected statement. The motion shall be supported by an affidavit and shall show that the correction is essential to the ends of justice and shall be accompanied by the corrected statement. The motion shall be filed as soon as practical after discovery of the error.

(b) When a party cannot attach a copy of a drawing or a written description to the party's preliminary statement as required by § 1.623(c), 1.624(c), or 1.625(c), the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion (§ 1.635) to amend its preliminary statement promptly after the first drawing, first written description, or drawing or written description first introduced into the United States becomes available. A copy of the drawing or written description may be obtained, where appropriate, by a motion (§ 1.635) for additional discovery under §1.687 or during a testimony period.

§ 1.629 Effect of preliminary statement.

(a) A party shall be strictly held to any date alleged in the preliminary statement. Doubts as to (1) definiteness or sufficiency of any allegation in a preliminary statement or (2) compliance with formal requirements will be resolved against the party filing the statement by restricting the party to the earlier of its filing date or effective filing date or to the latest date of a period alleged in the preliminary statement as may be appropriate. A party may not correct a preliminary statement except as provided by § 1.628.

(b) Evidence which shows that an act alleged in the preliminary statement occurred prior to the date alleged in the statement shall establish only that the act occurred as early as the date alleged in the statement.

(c) If a party does not file a preliminary statement, the party:

(1) Shall be restricted to the earlier of the party's filing date or effective filing date and

(2) Will not be permitted to prove that:

(i) The party made the invention prior to the party's filing date or

(ii) Any opponent derived the invention from the party.

(d) If a party files a preliminary statement which contains an allegation of a date of first drawing or first written description and the party does not file a copy of the first drawing or written description with the preliminary statement as required by § 1.623(c), § 1.624(c), or § 1.625(c), the party will be restricted to the earlier of the party's filing date or effective filing date as to that allegation unless the party complies with § 1.628(b). The content of any drawing or written description submitted with a preliminary statement will not normally be evaluated or considered by the Board.

(e) A preliminary statement shall not be used as evidence on behalf of the party filing the statement.

§ 1.630 Reliance on earlier application.

A party shall not be entitled to rely on the filing date of an earlier application filed in the United States or abroad unless (a) the earlier application is identified (§ 1.611(c)(5)) in the notice declaring the interference or (b) the party files a preliminary motion under § 1.633 seeking the benefit of the filing date of the earlier application.

§ 1.631 Access to preliminary statement, service of preliminary statement.

(a) Unless otherwise ordered by an examiner-in-chief, concurrently with entry of a decision by the examiner-in-chief on preliminary motions filed under

§ 1.633, any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement. Within a time set by the examiner-in-chief, a party shall serve copies of its preliminary statement on every opponent who served a notice under § 1.621(b).

(b) A junior party who does not file a preliminary statement shall not have access to the preliminary statement of any other party.

(c) If an interference is terminated before the preliminary statements have been opened, the preliminary statements will remain sealed and will be returned to the respective parties who submitted the statements.

§ 1.632 Notice of intent to argue abandonment, suppression or concealment by opponent.

A notice shall be filed by a party who intends to argue that an opponent has abandoned, suppressed or concealed an actual reduction to practice (35 U.S.C. 102(g)). A party will not be permitted to argue abandonment, suppression, or concealment by an opponent unless the notice is timely filed. Unless authorized otherwise by an examiner-in-chief, a notice is timely when filed within ten (10) days of the close of the testimony-in-chief of the opponent.

§ 1.633 Preliminary Motions.

A party may file the following preliminary motions:

(a) A motion for judgment on the ground that an opponent's claim corresponding to a count is not patentable to the opponent. In determining a motion filed under this paragraph, a claim may be construed by reference to the prior art of record. A motion under this paragraph shall not be based on: (1) Priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. See § 1.637(a).

(b) A motion for judgment on the ground that there is no interference-in-fact. A motion under this paragraph is proper only if: (1) The interference involves a design application or patent or a plant application or patent or (2) no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. See § 1.637(a).

(c) A motion to redefine the interfering subject matter by (1) adding or substituting a count, (2) amending an application claim corresponding to a count or adding a claim in the moving party's application to be designated to correspond to a count, (3) designating an application or patent claim to correspond to a count, (4) designating an application or patent claim as not corresponding to a count, or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. See § 1.637 (a) and (c).

(d) A motion to substitute a different application owned by a party for an application involved in the interference. See § 1.637 (a) and (d).

(e) A motion to declare an additional interference (1) between an additional application not involved in the interference and owned by a party and an opponent's application or patent involved in the interference or (2) when an interference involves three or more parties, between less than all applications and any patent involved in the interference. See § 1.637 (a) and (e).

(f) A motion to be accorded the benefit of the filing date of an earlier application filed in the United States or abroad. See § 1.637 (a) and (f).

(g) A motion to attack the benefit accorded an opponent in the notice declaring the interference of the filing date of an earlier application filed in the United States or abroad. See § 1.637 (a) and (g).

(h) When a patent is involved in an interference and the patentee has on file or files an application for reissue under § 1.171, a motion to add the application for reissue to the interference. See § 1.637 (a) and (h).

(i) When a motion is filed under paragraph (a), (b), or (g) of this section, an opponent, in addition to opposing the motion, may file a motion to redefine the interfering subject matter under paragraph (c) of this section or a motion to substitute a different application under paragraph (d) of this section.

(j) When a motion is filed under paragraph (c)(1) of this section an opponent, in addition to opposing the motion, may file a motion for benefit under paragraph (f) of this section as to the count to be added or substituted.

§ 1.634 Motion to correct inventorship.

A party may file a motion to (a) amend its application involved in an interference to correct inventorship as provided by § 1.48 or (b) correct inventorship of its patent involved in an interference as provided in § 1.324. See § 1.637(a).

§ 1.635 Miscellaneous motions.

A party seeking entry of an order relating to any matter other than a matter which may be raised under §§ 1.633 or 1.634 may file a motion requesting entry of the order. See § 1.637 (a) and (b).

§ 1.636 Motions, time for filing.

(a) A preliminary motion under § 1.633 (a) through (h) shall be filed within a time period set by an examiner-in-chief.

(b) A preliminary motion under § 1.633 (i) or (j) shall be filed within 20 days of the service of the preliminary motion under § 1.633 (a), (b), or (g) unless otherwise ordered by an examiner-in-chief.

(c) A motion under § 1.634 shall be diligently filed after an error is discovered in the inventorship of an application or patent involved in an interference unless otherwise ordered by an examiner-in-chief.

(d) A motion under § 1.635 shall be filed as specified in this subpart or when appropriate unless otherwise ordered by an examiner-in-chief.

§ 1.637 Content of motions.

(a) Every motion shall include (1) a statement of the precise relief requested, (2) a statement of the material facts in support of the motion, and (3) a full statement of the reasons why the relief requested should be granted.

(b) A motion under § 1.635 shall contain a certificate by the moving party stating that the moving party has conferred with all opposing parties in an effort in good faith to resolve by agreement the issues raised by the motion. A moving party shall indicate in the motion whether any other party plans to oppose the motion. The provisions of this paragraph do not apply to a motion to suppress evidence (§ 1.656(h)).

(c) A preliminary motion under § 1.633(c) shall explain why the interfering subject matter should be redefined.

(1) A preliminary motion seeking to add or substitute a count shall:

(i) Propose each count to be added or substituted.

(ii) When the moving party is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to, the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iii) Identify all claims in an opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a

claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(iv) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(v) Show that each proposed count defines a separate patentable invention from every other count in the interference.

(vi) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(2) A preliminary motion seeking to amend an application claim corresponding to a count or adding a claim to be designated to correspond to a count shall:

(i) Propose an amended or added claim.

(ii) Show that the proposed or added claim defines the same patentable invention as the count.

(iii) Show the patentability to the applicant of each amended or added claim and apply the terms of the amended or added claim to the disclosure of the application; when necessary a moving party applicant shall file with the motion an amendment making the amended or added claim to the application.

(iv) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(3) A preliminary motion seeking to designate an application or patent claim to correspond to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim defines the same patentable invention as the count.

(iii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(4) A preliminary motion seeking to designate an application or patent claim as not corresponding to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim does not define the same patentable invention as any other claim designated in the notice declaring the interference as corresponding to the count.

(5) A preliminary motion seeking to require an opponent who is an applicant to add a claim and designate the claim as corresponding to a count shall:

(i) Propose a claim to be added by the opponent.

(ii) Show the patentability to the opponent of the claim and apply the terms of the claim to the disclosure of the opponent's application.

(iii) Identify the count to which the claim shall be designated to correspond.

(iv) Show the claim defines the same patentable invention as the count to which it will be designated to correspond.

(d) A preliminary motion under § 1.633(d) to substitute a different application shall:

(1) Identify the different application.

(2) Certify that a complete copy of the file of the different application, except for documents filed under § 1.131 or § 1.608(b), has been served on all opponents.

(3) Show the patentability to the applicant of all claims in, or proposed to be added to, the different application which correspond to each count and apply the terms of the claims to the disclosure of the different application; when necessary the applicant shall file with the motion an amendment adding a claim to the different application.

(4) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(e) A preliminary motion to declare an additional interference under § 1.633(e) shall explain why an additional interference is necessary.

(1) When the preliminary motion seeks an additional interference under § 1.633(e)(1), the motion shall:

(i) Identify the additional application.

(ii) Certify that a complete copy of the file of the additional application, except for documents filed under §§ 1.131 or 1.608(b), has been served on all opponents.

(iii) Propose a count for the additional interference.

(iv) Show the patentability to the applicant of all claims in, or proposed to be added to, the additional application which correspond to each proposed count for the additional interference and apply the terms of the claims to the disclosure of the additional application; when necessary the applicant shall file with the motion an amendment adding a claim to the additional application.

(v) When the opponent is an applicant, show the patentability to the opponent of any claims in, or proposed to be added to, the opponent's application which correspond to the proposed count and apply the terms of the claims to the disclosure of the opponent's application.

(vi) When the opponent is a patentee, designate the claims of the patent which define the same patentable invention defined by the proposed count.

(vii) Show that each proposed count for the additional interference defines a separate patentable invention from all counts of the interference in which the motion is filed.

(viii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(2) When the preliminary motion seeks an additional interference under § 1.633(e)(2), the motion shall:

(i) Identify any application or patent to be involved in the additional interference.

(ii) Propose a count for the additional interference.

(iii) When the moving party's is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to, the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iv) Identify all claims in any opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(v) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(vi) Show that each proposed count for the additional interference defines a separate patentable invention from all counts in the interference in which the motion is filed.

(vii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(f) A preliminary motion for benefit under § 1.633(f) shall:

(1) Identify the earlier application.

(2) When the earlier application is an application filed in the United States, certify that a complete copy of the file of the earlier application, except for documents filed under § 1.131 or § 1.608(b), has been served on all opponents. When the earlier application is an application filed abroad, certify that a copy of the application filed abroad has been served on all opponents. If the earlier application filed abroad is not in English, the requirements of § 1.647 must also be met.

(3) Show that the earlier application constitutes a constructive reduction to practice of each count.

(g) A preliminary motion to attack benefit under § 1.633(g) shall explain, as to each count, why an opponent should not be accorded the benefit of the filing date of the earlier application.

(h) A preliminary motion to add an application for reissue under § 1.633(h) shall:

(1) Identify the application for reissue.

(2) Certify that a complete copy of the file of the application for reissue has been served on all opponents.

(3) Show the patentability of all claims in, or proposed to be added to, the application for reissue which correspond to each count and apply the terms of the claims to the disclosure of the application for reissue; when necessary a moving applicant for reissue shall file with the motion an amendment adding a claim to the application for reissue.

(4) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

§ 1.638 Opposition and reply, time for filing opposition and reply.

(a) Unless otherwise ordered by an examiner-in-chief, any opposition to any motion shall be filed within 20 days after service of the motion. An opposition shall (1) identify any material fact set forth in the motion which is in dispute and (2) include an argument why the relief requested in the motion should be denied.

(b) Unless otherwise ordered by an examiner-in-chief, a reply shall be filed within 15 days after service of the opposition. A reply shall be directed only to new points raised in the opposition.

§ 1.639 Evidence in support of motion, opposition, or reply.

(a) Proof of any material fact alleged in a motion, opposition, or reply must be filed and served with the motion, oppposition, or reply unless the proof relied upon is part of the interference file or the file of any patent or application involved in the interference or any earlier application filed in the United States of which a party has been accorded or seeks to be accorded benefit.

(b) Proof may be in the form of patents, printed publications, and affidavits.

(c) When a party believes that testimony is necessary to support or oppose a preliminary motion under § 1.633 or a motion to correct inventorship under § 1.634, the party shall describe the nature of the testimony needed. If the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

§ 1.640 Motions, hearing and decision, redeclaration of interference, order to show cause.

(a) A hearing on a motion may be held in the discretion of the examiner-in-chief. The examiner-in-chief shall set the date and time for any hearing. The length of oral argument at a hearing on a motion is a matter within the discretion of the examiner-in-chief. An examiner-in-chief may direct that a hearing take place by telephone.

(b) Motions will be decided by an examiner-in-chief. An examiner-in-chief may consult with an examiner in deciding motions involving a question of patentability. An examiner-in-chief may grant or deny any motion or take such other action which will secure the just, speedy, and inexpensive determination of the interference.

(1) When preliminary motions under § 1.633 are decided, the examiner-in-chief will, when necessary, set a time for filing any amendment to an application involved in the interference and for filing a supplemental preliminary statement as to any new counts involved in the interference. Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved. A supplemental preliminary statement shall meet the requirements specified in §§ 1.623, 1.624, 1.625, or 1.626, but need not be filed if a party states that it intends to rely on a preliminary statement previously filed under § 1.621(a). After the time expires for filing any amendment and supplemental preliminary statement, the examiner-in-chief will, if necessary, redeclare the interference.

(2) After a decision is entered or preliminary motions filed under § 1.633, a further motion under § 1.633 will not be considered except as provided by § 1.655(b).

(c) When a decision on any motion under §§ 1.633, 1.634, or 1.635 is entered which does not result in the issuance of an order to show cause under paragraph (d) of this section, a party may file a request for reconsideration within 14 days after the date of the decision. The filing of a request for reconsideration will not stay any time period set by the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. No opposition to a request for reconsideration shall be filed unless requested by an examiner-in-chief or the Board. A decision of single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board. The request for reconsideration shall be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom will normally be the examiner-in-chief who decided the motion.

(d) An examiner-in-chief may issue an order to show cause why judgment should not be entered against a party when:

(1) A decision on a motion is entered which is dispositive of the interference against the party as to all counts;

(2) The party is a junior party who fails to file a preliminary statement; or

(3) The party is a junior party whose preliminary statement fails to overcome the earlier of the filing date or effective filing date of another party.

(e) When an order to show cause is issued under paragraph (d) of this section, the Board shall enter a judgment in accordance with the order unless, within 20 days after the date of the order, the party against whom the order issued filed a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 20 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party. If a party wishes to take testimony in response to an order to show cause, the party's response should be accompanied by a motion (§ 1.635) requesting the testimony period. See § 1.651(c)(4).

§ 1.641 Unpatentability discovered by examiner-in-chief.

During the pendency of an interference, if the examiner-in-chief becomes aware of a reason why a claim corresponding to a count may not be patentable, the examiner-in-chief may notify the parties of the reason and set a time within which each party may present its views. After considering any timely filed views, the examiner-in-chief shall decide how the interference shall proceed.

§ 1.642 Addition of application or patent to interference.

During the pendency of an interference, if the examiner-in-chief

becomes aware of an application or a patent not involved in the interference which claims the same patentable invention as a count in the interference, the examiner-in-chief may add the application or patent to the interference on such terms as may be fair to all parties.

§ 1.643 Prosecution of interference by assignee.

(a) An assignee of record in the Patent and Trademark Office of the entire interest in an application or patent involved in an interference is entitled to conduct prosecution of the interference to the exclusion of the inventor.

(b) An assignee of a part interest in an application or patent involved in a interference may file a motion (§ 1.635) for entry of an order authorizing it to prosecute the interference. The motion shall show (1) the inability or refusal of the inventor to prosecute the interference or (2) other cause why the ends of justice require that the assignee of a part interest be permitted to prosecute the interference. The examiner-in-chief may allow the assignee of a part interest to prosecute the interference upon such terms as may be appropriate.

§ 1.644 Petitions in interferences.

(a) There is no appeal to the Commissioner in an interference from a decision of an examiner-in-chief or a panel consisting of more than one examiner-in-chief. The Commissioner will not consider a petition in an interference unless:

(1) The petition is from a decision of an examiner-in-chief or a panel and the examiner-in-chief or the panel shall be of the opinion (i) that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision on petition by the Commissioner may materially advance the ultimate termination of the interference;

(2) The petition seeks to invoke the supervisory authority of the Commissioner and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence; or

(3) The petition seeks relief under § 1.183.

(b) A petition under paragraph (a)(1) of this section filed more than 15 days after the date of the decision of the examiner-in-chief or the panel may be dismissed as untimely. A petition under paragraph (a)(2) of this section shall not be filed prior to decision by the Board awarding judgment. Any petition under paragraph (a)(3) of this section shall be timely if it is made as part of, or simultaneously with, a proper motion under §§ 1.633, 1.634, or 1.635. Any opposition to a petition shall be filed within 15 days of the date of service of the petition.

(c) The filing of a petition shall not stay the proceeding unless a stay is granted in the discretion of the examiner-in-chief, the panel, or the Commissioner.

(d) Any petition must contain a statement of the facts involved and the point or points to be reviewed and the action requested. Briefs or memoranda, if any, in support of the petition or opposition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the examiner-in-chief or the panel and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record in the interference shall not be submitted with the petition or opposition.

(e) Any petition under paragraph (a) of this section shall be accompanied by the petition fee set forth in § 1.17(h).

(f) Any request for reconsideration of a decision by the Commissioner shall be filed within 15 days of the decision of the Commissioner and must be accompanied by the fee set forth in § 1.17(h). No opposition to a request for reconsideration shall be filed unless requested by the Commissioner. The decision will not ordinarily be modified unless such an opposition has been requested by the Commissioner.

(g) Where reasonably possible, service of any petition, opposition, or request for reconsideration shall be such that delivery is accomplished within one working day. Service by hand or "Express Mail" complies with this paragraph.

(h) An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(i) The Commissioner may delegate to appropriate Patent and Trademark Offfice employees the determination of petition under this section.

§ 1.645 Extension of time, late papers, stay of proceedings.

(a) A party may file a motion (§ 1.635) seeking an extension of time to take action in an interference, to file a notice of appeal (§§ 1.302, 1.304), or to commence a civil action (§§ 1.303, 1.304). The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action, filing the notice, or commencing the civil action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proved through the witness.

(b) Any paper belatedly filed will not be considered except upon motion (§1.635) which shows sufficient cause why the paper was not timely filed.

(c) The provisions of § 1.136 do not apply to time periods in interferences.

(d) In an appropriate circumstance, an examiner-in-chief may stay proceedings in an interference.

§ 1.646 Service of papers, proof of service.

(a) A copy of evey paper filed in the Patent and Trademark Office in an interference or an application or patent involved in the interference shall be served upon all other parties except:

(1) Preliminary statements when filed under § 1.621; preliminary statements shall be served when service is ordered by an examiner-in-chief.

(2) Certified transcripts and exhibits which accompany the transcripts filed under §§ 1.676 or 1.684; copies of transcripts shall be served as part of a party's record under § 1.653(c).

(b) Service shall be on an attorney or agent for a party. If there is no attorney or agent for the party, service shall be on the party. An examiner-in-chief may order additional service or waive service where appropriate.

(c) Unless otherwise ordered by an examiner-in-chief, or except as otherwise provided by this part, service of a paper shall be made as follows:

(1) By handing a copy of the paper to the person served.

(2) By leaving a copy of the paper with someone employed by the person at the person's usual place of business.

(3) When the person served has no usual place of business, by leaving a copy of the paper at the person's residence with someone of suitable age and discretion then residing therein.

(4) By mailing a copy of the paper by first class mail; when service is by mail

the date of mailing is regarded as the date of service.

(5) When it is shown to the satisfaction of an examiner-in-chief that none of the above methods of obtaining or serving the copy of the paper was successful, the examiner-in-chief may order service by publication of an appropriate notice in the *Official Gazette*.

(d) An examiner-in-chief may order that a paper be served by hand or "Express Mail".

(e) Proof of service must be made before a paper will be considered in an interference. Proof of service may appear on or be affixed to the paper. Proof of service shall include the date and manner of service. In the case of personal service under paragraphs (c)(1) through (c)(3) of this section, proof of service shall include the names of any person served and the person who made the service. Proof of service may be made by an acknowledgment of service by or on behalf of the person served or a statement signed by the party or the party's attorney or agent containing the information required by this section. A statement of an attorney or agent attached to, or appearing in, the paper stating the date and manner of service will be accepted as *prima facie* proof of service.

§ 1.647 Translation of document in foreign language.

When a party relies on a document in a language other than English, a translation of the document into English and an affidavit attesting to the accuracy of the translation shall be filed with the document.

§ 1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.

(a) At an appropriate stage in an interference, an examiner-in-chief shall set (1) a time for filing motions (§ 1.635) for additional discovery under § 1.687(c) and (2) testimony periods for taking any necessary testimony.

(b) Where appropriate, testimony periods will be set to permit a party to:

(1) Present its case-in-chief and/or case-in-rebuttal and/or

(2) Cross-examine an opponent's case-in-chief and/or a case-in-rebuttal.

(c) A party is not entitled to take testimony to present a case-in-chief unless:

(1) The examiner-in-chief orders the taking of testimony under § 1.639(c);

(2) The party alleges in its preliminary statement a date of invention prior to the ealier of the filing date or effective filing date of the senior party;

(3) A testimony period has been set to permit an opponent to prove a date of invention prior to the earlier of the filing date or effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to that date; or

(4) A motion (§ 1.635) is filed showing good cause why a testimony period should be set.

(d) Testimony shall be taken during the testimony periods set under paragraph (a) of this section.

§ 1.652 Judgment for failure to take testimony or file record.

If a junior party fails to timely take testimony authorized under § 1.651, or file a record under § 1.653(c), an examiner-in-chief, with or without a motion (§ 1.635) by another party, may issue an order to show cause why judgment should not be entered against the junior party. When an order is issued under this section, the Board shall enter judgment in accordance with the order unless, within 15 days after the date of the order, the junior party files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 15 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party.

§ 1.653 Record and exhibits.

(a) Testimony shall consist of affidavits under § 1.672 (b) and (e), transcripts of depositions under §§ 1.672 (b) and (c), agreed statements of fact under § 1.672(f), and transcripts of interrogatories, cross-interrogatories, and recorded answers under § 1.684(c).

(b) An affidavit shall be filed as set forth in § 1.672 (b) or (e). A certified transcript of a deposition including a deposition cross-examining an affiant, shall be filed as set forth in § 1.676. An original agreed statement shall be filed as set forth in § 1.672(f). A transcript of interrogatories, cross-interrogatories, and recorded answers shall be filed as set forth under § 1.684(c).

(c) In addition to the items specified in paragraph (b) of this section and within a time set by an examiner-in-chief each party shall file three copies and serve one copy of a record consisting of:

(1) An index of the names of each witness giving the pages of the record where the direct testimony and cross-examination of each witness begins.

(2) An index of exhibits briefly describing the nature of each exhibit and giving the page of the record where each exhibit is first identified and offered into evidence.

(3) The count or counts.

(4) Each (i) affidavit, (ii) transcript, including transcripts of cross-examination of any affiant, (iii) agreed statement relied upon by the party, and (iv) transcript of interrogatories, cross-interrogatories, and recorded answers filed under paragraph (b) of this section.

(5) Each notice, official record, and publication relied upon by the party an filed under § 1.682(a).

(6) Any evidence from another interference, proceeding, or action relied upon by the party under § 1.683.

(7) Each request for an admission and the admission and each written interrogatory and the answer upon which a party intends to rely under § 1.688.

(d) The pages of the record shall be consecutively numbered.

(e) The name of each witness shall appear at the top of each page of each affidavit or transcript.

(f) The record may be typewritten or printed.

(g) When the record is printed, it may be produced by standard typographical printing or by any process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Margins must be justified. Footnotes may not be printed in type smaller than 9 point. The pages size shall be 8½ by 11 inches (21.8 by 27.9 cm.) with type matter 6½ by 9½ inches (16.5 by 24.1 cm.). The record shall be found to lie flat when open.

(h) When the record is typewritten, it must be clearly legible on opaque, unglazed, durable paper approximately 8½ by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1½ (3.8 cm.) on the left-hand side of the page. The pages of the record shall be bound with covers at their left edges in such manner to lie flat when open in one or more volumes of convenient size (approximately 100 pages per volume is suggested). Multigraphed or otherwise reproduced copies conforming to the standards specified in this paragraph may be accepted.

(i) Each party shall file its exhibits with the record specified in paragraph (c) of this section. One copy of each documentary exhibit shall be served. Documentary exhibits shall be filed in an envelope or folder and shall not be bound as part of the record. Physical exhibits, if not filed by an officer under § 1.676(d), shall be filed with the record.

Each exhibit shall contain a label which identifies the party submitting the exhibit and an exhibit number, the style of the interference (e.g., Jones v. Smith), and the interference number. Where possible, the label should appear at the bottom right-hand corner of each documentary exhibit. Upon termination of an interference, an examiner-in-chief may return and exhibit to the party filing the exhibit. When any exhibit is returned, the examiner-in-chief shall enter an appropriate order indicating that the exhibit has been returned.

(j) Any testimony, record, or exhibit which does not comply with this section may be returned under § 1.618(a).

§ 1.654 Final hearing.

(a) At an appropriate stage of the interference, the parties will be given an opportunity to appear before the Board to present oral argument at a final hearing. An examiner-in-chief shall set a date and time for final hearing. Unless otherwise ordered by an examiner-in-chief or the Board, each party will be entitled to no more than 60 minutes of oral argument at final hearing.

(b) The opening argument of a junior party shall include a fair statement of the junior party's case and the junior party's position with respect to the case presented on behalf of any other party. A junior party may reserve a portion of its time for rebuttal.

(c) A party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under §1.632 was timely filed.

(d) After final hearing, the interference shall be taken under advisement by the Board. No further paper shall be filed except under § 1.658(b) or as authorized by an examiner-in-chief or the Board. No additional oral argument shall be had unless ordered by the Board.

§ 1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue including (1) priority of invention, (2) derivation by an opponent from a party who filed a preliminary statement under §1.625, (3) patentability of the invention, (4) admissibility of evidence, (5) any interlocutory matter deferred to final hearing, and (6) any other matter necessary to resolve the interference. The Board may also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion. All interlocutory orders shall be presumed to have been correct and the burden of showing manifest error or an abuse of discretion shall be on the party attacking the order.

(b) A party shall not be entitled to raise for consideration at final hearing a matter which properly could have been raised by a motion under §§ 1.633 or 1.634 unless (1) the motion was properly filed, (2) the matter was properly raised by a party in an opposition to a motion under §§1.633 or 1.634 and the motion was granted over the opposition, or (3) the party shows good cause why the issue was not timely raised by motion or opposition.

(c) To prevent manifest injustice, the Board may consider an issue even though it would not otherwise be entitled to consideration under this section.

§ 1.656 Briefs for final hearing.

(a) Each party shall be entitled to file briefs for final hearing. The examiner-in-chief shall determine the briefs needed and shall set the time and order for filing briefs.

(b) The opening brief of a junior party shall contain under appropriate headings and in the order indicated:

(1) A table of contents, with page references, and a table of cases (alphabetically arranged), statutes, and other authorities cited, with references to the pages of the brief where they are cited.

(2) A statement of the issues presented for decision in the interference.

(3) A statement of the facts relevant to the issues presented for decision with appropriate references to the record.

(4) An argument, which may be preceded by a summary, which shall contain the contentions of the party with respect to the issues to be decided, and the reasons therefor, with citations to the cases, statutes, other authorities, and parts of the record relied on.

(5) A short conclusion stating the precise relief requested.

(6) An appendix containing a copy of the counts.

(c) The opening brief of the senior party shall conform to the requirements of paragraph (b) of this section except:

(1) a statement of the issues and of the facts need not be made unless the party is dissatisfied with the statement in the opening brief of the junior party and

(2) an appendix containing a copy of the counts need not be included if the copy of the counts in the opening brief of the junior party is correct.

(d) Briefs may be printed or typewritten. If typewritten, legal-size paper may be used. The opening brief of each party in excess of 50 legal-size double-spaced typewritten pages or any other brief in excess of 25 legal-size double-spaced typewritten pages shall be printed unless a satisfactory reason be given why the brief should not be printed. Any printed brief shall comply with the requirements of § 1.653(g). Any typewritten brief shall comply with the requirements of § 1.653(h), except legal-size paper may be used and the binding and covers specified are not required.

(e) An original and three copies of each brief must be filed.

(f) Any brief which does not comply with the requirements of this section may be returned under § 1.618(a).

(g) Any party, separate from its opening brief, but filed concurrently therewith, may file an original and three copies of concise proposed findings of fact and conclusions of law. Any proposed findings of fact shall be supported by specific references to the record. Any proposed conclusions of law shall be supported by citation of cases, statutes, or other authority. Any opposing party, separate from its opening or reply brief, but filed concurrently therewith, may file a paper accepting or objecting to any proposed findings of fact or conclusions of law; when objecting, a reason must be given. The Board may adopt the proposed findings of fact and conclusions of law in whole or in part.

(h) If a party wants the Board in rendering its final decision to rule on the admissibility of any evidence, the party shall file with its opening brief an original and three copies of a motion (§ 1.635) to suppress the evidence. The provisions of § 1.637(b) do not apply to a motion to suppress under this paragraph. Any objection previously made to the admissibility of an opponent's evidence is waived unless the motion required by this paragraph is filed. An original and three copies of an opposition to the motion may be filed with an opponent's opening brief or reply brief as may be appropriate.

(i) When a junior party fails to timely file an opening brief, an order may issue requiring the junior party to show cause why the Board should not treat failure to file the brief as a concession of priority. If the junior party fails to respond within a time period set in the order, judgment may be entered against the junior party.

§ 1.657 Burden of proof as to date of invention.

A rebuttable presumption shall exist that, as to each count, the inventors made their invention in the chronological order of the earlier of their filing dates or effective filing dates. The burden of proof shall be upon a party who contends otherwise.

§ 1.658 Final decision.

(a) After final hearing, the Board shall enter a decision resolving the issues raised at final hearing. The decision may (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief for further proceedings, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing the claims in the party's patent or application which correspond to the count. When the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision.

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within 14 days after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

(c) A judgment in an interference settles all issues which (1) were raised and decided in the interference, (2) could have been properly raised and decided in the interference by a motion under § 1.633 (a) through (d) and (f) through (j) or § 1.634 and (3) could have been properly raised and decided in an additional interference with a motion under § 1.633(e). A losing party who could have properly moved, but failed to move, under §§ 1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment.

§ 1.659 Recommendation.

(a) Should the Board have knowledge of any ground for rejecting any application claim not involved in the judgment of the interference, it may include in its decision a recommended rejection of the claim. Upon resumption of *ex parte* prosecution of the application, the examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection.

(b) Should the Board have knowledge of any ground for reexamination of a patent involved in the interference as to a patent claim not involved in the judgment of the interference, it may include in its decision a recommendation to the Commissioner that the patent be reexamined. The Commissioner will determine whether reexamination will be ordered.

(c) The Board may make any other recommendation to the examiner or the Commissioner as may be appropriate.

§ 1.660 Notice of reexamination, reissue, protest, or litigation.

(a) When a request for reexamination of a patent involved in an interference is filed, the patent owner shall notify the Board within 10 days of receiving notice that the request was filed.

(b) When an application for reissue is filed by a patentee involved in an interference, the patentee shall notify the Board within 10 days of the day the application for reissue is filed.

(c) When a protest under § 1.291 is filed against an application involved in an interference, the applicant shall notify the Board within 10 days of receiving notice that the protest was filed.

(d) A party in an interference shall notify the Board promptly of any litigation related to any patent or application involved in an interference, including any civil action commenced under 35 U.S.C. 146.

§ 1.661 Termination of interference after judgment.

After a final decision is entered by the Board, an interference is considered terminated when no appeal (35 U.S.C. 141) or other review (35 U.S.C. 146) has been or can be taken or had.

§ 1.662 Request for entry of adverse judgment; reissue filed by patentee.

(a) A party may, at any time during an interference, request and agree to entry of an adverse judgment. The filing by an applicant or patentee of a written disclaimer of the invention defined by a count, concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count, or abandonment of the contest as to a count will be treated as a request for entry of an adverse judgment against the applicant or patentee as to all claims which correspond to the count. Abandonment of an application by an applicant, other than an applicant for reissue having a claim of the patent sought to be reissued involved in the interference, will be treated as a request for entry of an adverse judgment against the applicant as to all claims corresponding to all counts. Upon the filing by a party of a request for entry of an adverse judgment, the Board may enter judgment against the party.

(b) If a patentee involved in an interference files an application for reissue during the interference and omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference, judgment may be entered against the patentee. A patentee who files an application for reissue other than for the purpose of avoiding the interference shall timely file a preliminary motion under § 1.633(h) or show good cause why the motion could not have been timely filed.

(c) The filing of a statutory disclaimer under 35 U.S.C. 253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference. A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count.

§ 1.663 Status of claim of defeated applicant after interference.

Whenever an adverse judgment is entered as to a count against an applicant from which no appeal (35 U.S.C. 141) or other review (35 U.S.C. 146) has been or can be taken or had, the claims of the application corresponding to the count stand finally disposed of without further action by the examiner. Such claims are not open to further *ex parte* prosecution.

§ 1.664 Action after interference.

(a) After termination of an interference, the examiner will promptly take such action in any application previously involved in the interference as may be necessary. Unless entered by order of an examiner-in-chief, amendments presented during the interference shall not be entered, but may be subsequently presented by the applicant subject to the provisions of this part provided prosecution of the application is not otherwise closed.

(b) After judgment, the application of any party may be held subject to further examination, including an interference with another application.

§ 1.665 Second interference.

A second interference between the same parties will not be declared upon an application not involved in an earlier interference for an invention defined by a count of the earlier interference. See § 1.658(c).

§ 1.666 Filing of interference settlement agreements.

(a) Any agreement or understanding between parties to an interference, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the interference, must be in writing and a true copy thereof must be filed before the termination of the interference (§ 1.661) as between the parties to the agreement or understanding.

(b) If any party filing the agreement or understanding under paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in § 1.17(i) and on a showing of good cause.

(c) Failure to file the copy of the agreement or understanding under paragraph (a) of this section will render permanently unenforceable such agreement or understanding and any patent of the parties involved in the interference or any patent subsequently issued on any application of the parties so involved. The Commission may, however, upon petition accompanied by the fee set forth in § 1.17(h) and on a showing of good cause for failure to file within the time prescribed, permit the filing of the agreement or understanding during the six month period subsequent to the termination of the interference as between the parties to the agreement or understanding.

§ 1.671 Evidence must comply with rules.

(a) Evidence consists of testimony and exhibits, official records and publications filed under § 1.682, evidence from another interference, proceeding, or action filed under § 1.683, and discovery relied upon under § 1.688, and the specification (including claims) and drawings of any application or patent:

(1) Involved in the interference.

(2) To which a party has been accorded benefit in the notice declaring the interference or by a preliminary motion granted under § 1.633.

(3) For which a party has sought, but has been denied, benefit by a preliminary motion under § 1.633.

(4) For which benefit was rescinded by a preliminary motion granted under § 1.633.

(b) Except as otherwise provided in this part, the Federal Rules of Evidence shall apply to interference proceedings. Those portions of the Federal Rules of Evidence relating to criminal actions, juries, and other matters not relevant to interferences shall not apply.

(c) Unless the context is otherwise clear, the following terms of the Federal Rules of Evidence shall be construed as follows:

(1) "Courts of the United States," "U.S. Magistrate," "court," "trial court," or "trier of fact" means examiner-in-chief or Board as may be appropriate.

(2) "Judge" means examiner-in-chief.

(3) "Judicial notice" means official notice.

(4) "Civil action," "civil proceeding," "action," or "trial," mean interference.

(5) "Appellate court" means United States Court of Appeals for the Federal Circuit or a United States district court when judicial review is under 35 U.S.C. 146.

(6) "Before the hearing" in Rule 703 means before giving testimony by oral deposition or affidavit.

(7) "The trial or hearing" in Rules 803(24) and 804(5) means the taking of testimony by oral deposition.

(d) Certification is not necessary as a condition to admissibility when the record is a record of the Patent and Trademark Office to which all parties have access.

(e) A party may not rely on an affidavit filed by that party during *ex parte* prosecution of an application, an affidavit under § 1.608(b), or an affidavit under § 1.639(b) unless: (1) A copy of the affidavit is or has been served and (2) a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit. When proper notice is given under this paragraph, the affidavit shall be deemed filed under § 1.672(b). A copy of the affidavit shall be included in the record (§ 1.653).

(f) The significance of documentary and other exhibits shall be discussed with particularity by a witness during oral deposition or in an affidavit.

(g) A party must file a motion (§ 1.635) seeking permission from an examiner-in-chief prior to taking testimony or seeking documents or things under 35 U.S.C. 24. The motion shall describe the general nature and the relevance of the testimony, document, or thing.

(h) Evidence which is not taken or sought and filed in accordance with this subpart shall not be admissible.

§ 1.672 Manner of taking testimony.

(a) Testimony of a witness may be taken by oral deposition or affidavit in accordance with this subpart.

(b) A party wishing to take the testimony of a witness whose testimony will not be compelled under 35 U.S.C. 24 may elect to present the testimony of the witness by affidavit or deposition. A party electing to present testimony of a witness by affidavit shall, prior to the close of the party's relevant testimony period, file and serve an affidavit of the witness or, where appropriate, a notice under § 1.671(e). To facilitate preparation of the record (§ 1.653 (g) and (h)), a party shall file an affidavit on paper which is 8½ by 11 inches (21.8 by 27.9 cm). A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document. After the affidavit is filed and within a time set by an examiner-in-chief, any opponent may file a request to cross-examine the witness on oral deposition. If any opponent requests cross-examination of an affiant, the party shall notice a deposition under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness whose testimony is presented by affidavit, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. A party electing to present testimony of a witness by deposition shall notice a deposition of the witness under § 1.673(a). The party who gives notice of a deposition shall be responsible for obtaining a court reporter and for filing a certified transcript of the deposition as required by § 1.676.

(c) A party wishing to take the testimony of a witness whose testimony will be compelled under 35 U.S.C. 24 must first obtain permission from an examiner-in-chief under § 1.671(g). If permission is granted, the party shall notice a deposition of the witness under § 1.673 and may proceed under 35 U.S.C. 24. The testimony of the witness shall be taken on oral deposition.

(d) Notwithstanding the provisions of this subpart, if the parties agree in writing, a deposition may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner, and when so taken may be used like other depositions.

(e) If the parties agree in writing, the testimony of any witness may be submitted in the form of an affidavit without opportunity for cross-examination. The affidavit of the witness shall be filed in the Patent and Trademark Office.

(f) If the parties agree in writing, testimony may be submitted in the form of an agreed statement setting forth: (1) How a particular witness would testify if called or (2) the facts in the case of one or more of the parties. The agreed statement shall be filed in the Patent and Trademark Office. See § 1.653(a).

§ 1.673 Notice of examination of witness.

(a) A party electing to take testimony of a witness by deposition shall, after complying with paragraphs (b) and (g) of this section, file and serve a single notice of deposition stating the time and place of each deposition to be taken. Depositions may be noticed for a reasonable time and place in the United States. Unless the parties agree in writing, a deposition may not be noticed for any other place without approval of an examiner-in-chief (see § 1.684). The notice shall specify the name and address of each witness and the general nature of the testimony to be given by the witness. If the name of a witness is not known, a general description sufficient to identify the witness or a particular class or group to which the witness belongs may be given instead.

(b) Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:

(1) A list and copy of each document in the party's possession, custody, or control and upon which the party intends to rely at any deposition and

(2) A list of and a proffer of reasonable access to things in the party's possession, custody, or control and upon which the party intends to rely at any deposition.

(c) A party shall not be permitted to rely at any deposition on any witness not listed in the notice, or any document not served or any thing not listed as required by paragraph (b) of this section: (1) Unless all opponents agree in writing or on the record to permit the party to rely on the witness, document, or thing or (2) except upon a motion (§ 1.635) promptly filed which is accompanied by any proposed notice, additional documents, or lists and which shows sufficient cause why the notice, documents, or lists were not served in accordance with this section.

(d) Each opposing party shall have a full opportunity to attend a deposition and cross-examine. If an opposing party attends a deposition of a witness not named in a notice and cross-examines the witness or fails to object to the taking of the deposition, the opposing party shall be deemed to have waived any right to object to the taking of the deposition for lack of proper notice.

(e) A party electing to present testimony by affidavit and who is required to notice depositions for the purpose of cross-examination under § 1.672(b), shall, after complying with paragraph (g) of this section, file and serve a single notice of deposition stating the time and place of each cross-examination deposition to be taken.

(f) The parties shall not take depositions in more than one place at the same time or so nearly at the same time that reasonable opportunity to travel from one place of deposition to another cannot be had.

(g) Before serving a notice of deposition and after complying with paragraph (b) of this section, a party shall have an oral conference with all opponents to attempt to agree on a mutually acceptable time and place for conducting the deposition. A certificate shall appear in the notice stating that the oral conference took place or explaining why the conference could not be had. If the parties cannot agree to a mutually acceptable place and time for conducting the deposition at the conference, the parties shall contact an examiner-in-chief who shall then designate the time and place for conducting the deposition.

(h) A copy of the notice of deposition shall be attached to the certified transcript of the deposition filed under § 1.676(a).

§ 1.674 Persons before whom depositions may be taken.

(a) Within the United States or a territory or insular possession of the United States a deposition shall be taken before an officer authorized to administer oaths by the laws of the United States or of the place where the examination is held.

(b) Unless the parties agree in writing, the following persons shall not be competent to serve as an officer: (1) A relative or employee of a party, (2) a relative or employee of an attorney or agent of a party, or (3) a person interested, directly or indirectly, in the interference either as counsel, attorney, agent, or otherwise.

§ 1.675 Examination of witness, reading and signing transcript of deposition.

(a) Each witness before giving an oral deposition shall be duly sworn according to law by the officer before whom the deposition is to be taken.

(b) The testimony shall be taken in answer to interrogatories with any questions and answers recorded in their regular order by the officer or by some other person, who shall be subject to the provisions of § 1.674(b), in the presence of the officer unless the presence of the officer is waived on the record by agreement of all parties.

(c) All objections made at the time of the deposition to the qualifications of the officer taking the deposition, the manner of taking it, the evidence presented, the conduct of any party, or any other objection to the proceeding shall be noted on the record by the officer. Evidence objected to shall be taken subject to any objection.

(d) Unless the parties agree in writing or waive reading and signature by the witness on the record at the deposition, when the testimony has been transcribed a transcript of the deposition shall be read by the witness and then signed by the witness in the form of: (1) An affidavit in the presence of any notary or (2) a declaration.

§ 1.676 Certification and filing by officer, marking exhibits.

(a) The officer shall prepare a certified transcript of the deposition by attaching to a transcript of the deposition a copy of the notice of deposition, any exhibits to be annexed to the certified transcrip, and a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before commencement of testimony by the witness.

(2) The transcript is a true record of the testimony given by the witness.

(3) The name of the person by whom the testimony was recorded and, if not recorded by the officer, whether the testimony was recorded in the presence of the officer.

(4) The presence or absence of any opposing party.

(5) The place where the deposition was taken and the day and hour when the deposition began and ended.

(6) The officer is not disqualified under § 1.674.

(b) If the parties waived any of the requirements of paragraph (a) of this section, the certificate shall so state.

(c) The officer shall note on the certificate the circumstances under which a witness refuses to sign a transcript.

(d) Unless the parties agree otherwise in writing or on the record at the deposition, the officer shall securely seal the certified transcript in an envelope endorsed with the style of the interference (e.g., Smith v. Jones), the interference number, the name of the witness, and the date of sealing and shall promptly forward the envelope to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents and things produced for inspection during the examination of a witness, shall, upon request of a party, be marked for identification and annexed to the certified transcript, and may be inspected and copied by any party, except that if the person producing the documents and things desires to retain them, the person may: (1) Offer copies to be marked for identification and annexed to the certified transcript and to serve thereafter as originals if the person affords to all parties fair opportunity to verify the copies by comparison with the originals or (2) offer the originals to be marked for identification, after giving to each party an opportunity to inspect and copy them, in which event the documents and things may be used in the same manner as if annexed to the certified transcript. The exhibits shall then be filed as specified in § 1.653(i). If the weight or bulk of a document or thing shall reasonably prevent the document or thing from being annexed to the certified transcript, it shall, unless waived on the record at the deposition by all parties, be authenicated by the officer and fowarded to the Commissioner in a separate package marked and addressed as provided in this paragraph.

§ 1.677 Form of a transcript of deposition.

(a) A transcript of a deposition must be typewritten on opaque, unglazed, durable paper approximately 8½ by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1½ inches (3.8 cm.) on the left-hand side of the page. The pages must be consecutively numbered throughout the entire record of each party (§ 1.653(d)) and the name of the witness must be typed at the top of each page (§ 1.653(e)). The questions propounded to each witness must be consecutively numbered unless paper with numbered lines is used and each question must be followed by its answer.

(b) Exhibits must be numbered consecutively and each must be marked as required by § 1.653(i).

§ 1.678 Transcript of deposition must be filed.

Unless otherwise ordered by an examiner-in-chief, a certified transcript of a deposition must be filed in the Patent and Trademark Office within 45 days from the date of the deposition. If a party refuses to file a certified transcript, the examiner-in-chief or the Board may take appropriate action under § 1.616. If a party refuses to file a certified transcript, any opponent may move for leave to file the certified transcript and include a copy of the transcript as part of the opponent's record.

§ 1.679 Inspection of transcript.

A certified transcript filed in the Patent and Trademark Office may be inspected by any party. The certified transcript may not be removed from the Patent and Trademark Office for printing (§ 1.653(g)) unless authorized by an examiner-in-chief upon such terms as may be appropriate.

§ 1.682 Official records and printed publications.

(a) A party may introduce into evidence, if otherwise admissible, any official record or printed publication not identified on the record during the taking of testimony of a witness, by filing a notice offering the official record or publication into evidence. If the evidence relates to the party's case-in-chief, the notice shall be filed prior to close of testimony of the party's case-in-chief. If the evidence relates to rebuttal, the notice shall be filed prior to the close of testimony of the party's case-in-rebuttal. The notice shall: (1) Identify the official record or printed publication, (2) identify the portion thereof to be introduced in evidence, (3) indicate generally the relevance of the portion sought to be introduced in evidence, and (4) where appropriate, be accompanied by a certified copy of the official record or a copy of the printed publication (§ 1.671(d)).

(b) A copy of the notice, official record, and publication shall be served.

(c) Unless otherwise ordered by an examiner-in-chief, any written objection to the notice or to the admissibility of the official record or printed publication shall be filed within 15 days of service of the notice. See also § 1.656(h).

§ 1.683 Testimony in another interference, proceeding, or action.

(a) Prior to close of a party's appropriate testimony period or within such time as may be set by an examiner-in-chief, a party may file a motion (§ 1.635) for leave to use in an interference testimony of a witness from another interference, proceeding, or action involving the same parties, subject to such conditions as may be deemed appropriate by an examiner-in-chief. The motion shall specify with particularity the exact testimony to be used and shall demonstrate its relevance.

(b) Any objection to the admissibility of the testimony of the witness shall be made in an opposition to the motion. See also § 1.656(h).

§ 1.684 Testimony in a foreign country.

(a) An examiner-in-chief may authorize testimony of a witness to be taken in a foreign country. A party seeking to take testimony in a foreign country shall, prior to the close of the party's appropriate testimony period or within such time as may be set by an examiner-in-chief, file a motion (§ 1.635):

(1) Naming the witness.

(2) Describing the particular facts to which it is expected that the witness will testify.

(3) Stating the grounds on which the moving party believes that the witness will so testify.

(4) Demonstrating that the expected testimony is relevant.

(5) Demonstrating that the testimony cannot be taken in this country at all or cannot be taken in this country without hardship to the moving party greatly exceeding the hardship to which all opposing parties will be exposed by the taking of the testimony in a foreign country.

(6) Accompanied by an affidavit stating that the motion is made in good faith and not for the purpose of delay or harassing any party.

(7) Accompanied by written interrogatories to be asked of the witness.

(b) Any opposition under § 1.638(a) shall state any objection to the written interrogatories and shall include any cross-interrogatories to be asked of the witness. A reply under § 1.638(b) may be filed and shall be limited to stating any objection to any cross-interrogatories proposed in the opposition.

(c) If the motion is granted, the moving party shall be responsible for obtaining answers to the interrogatories and cross-interrogatories before an officer qualified to administer oaths in the foreign country under the laws of the United States or the foreign country. The officer shall prepare a transcript of the interrogatories, cross-interrogatories, and recorded answers to the interrogatories and cross-interrogatories

and shall transmit the transcript to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231, with a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before answering the interrogatories and cross-interrogatories.

(2) The recorded answers are a true record of the answers given by the witness to the interrogatories and cross-interrogatories.

(3) The name of the person by whom the answers were recorded and, if not recorded by the officer, whether the answers were recorded in the presence of the officer.

(4) The presence or absence of any party.

(5) The place, day, and hour that the answers were recorded.

(6) A copy of the recorded answers was read by or to the witness before the witness signed the recorded answers and that the witness signed the recorded answers in the presence of the officer. The officer shall state the circumstances under which a witness refused to read or sign recorded answers.

(7) The officer is not disqualified under § 1.674.

(d) If the parties agree in writing, the testimony may be taken before the officer on oral deposition.

(e) A party taking testimony in a foreign country shall have the burden of proving that false swearing in the giving of testimony is punishable as perjury under the laws of the foreign country. Unless false swearing in the giving of testimony before the officer shall be punishable as perjury under the laws of the foreign country where testimony is taken, the testimony shall not be entitled to the same weight as testimony taken in the United States. The weight of the testimony shall be determined in each case.

§ 1.685 Errors and irregularities in depositions.

(a) An error in a notice for taking a deposition is waived unless a motion (§ 1.635) to quash the notice is filed as soon as the error is, or could have been, discovered.

(b) An objection to a qualification of an officer taking a deposition is waived unless:

(1) The objection is made on the record of the deposition before a witness begins to testify.

(2) If discovered after the deposition, a motion (§ 1.635) to suppress the deposition is filed as soon as the objection is, or could have been, discovered.

(c) An error irregularity in the manner in which testimony is transcribed, a certified transcript is signed by a witness, or a certified transcript is prepared, signed, certified, sealed, indorsed, forwarded, filed, or otherwise handled by the officer is waived unless a motion (§ 1.635) to suppress the deposition is filed as soon as the error or irregularity is, or could have been, discovered.

(d) An objection to the competency of a witness, admissibility of evidence, manner of taking the deposition, the form of questions and answers, any oath or affirmation, or conduct of any party at the deposition is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Any objection which a party wishes considered by the Board at final hearing shall be included in a motion to suppress under § 1.656(h).

(e) Nothing in this section precludes taking notice of plain errors affecting substantial rights although they were not brought to the attention of an examiner-in-chief or the Board.

§ 1.687 Additional discovery.

(a) A party is not entitled to discovery except as authorized in this subpart.

(b) Where appropriate, a party may obtain production of documents and things during cross-examination of an opponent's witness or during the testimony period of the party's case-in-rebuttal.

(c) Upon a motion (§ 1.635) brought by a party within the time set by an examiner-in-chief under § 1.651 or thereafter as authorized by § 1.645 and upon a showing that the interest of justice so requires, an examiner-in-chief may order additional discovery, as to matters under the control of a party within the scope of the Federal Rules of Civil Procedure, specifying the terms and conditions of such additional discovery.

(d) The parties may agree to discovery among themselves at any time. In the absence of an agreement, a motion for additional discovery shall not be filed except as authorized by this subpart.

§ 1.688 Use of discovery.

(a) If otherwise admissible a party may introduce into evidence, an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under § 1.687 by filing a copy of the request for admission or the written interrogatory and the answer. If the answer relates to a party's case-in-chief, the answer shall be filed prior to the close of testimony of the party's case-in-chief. If the answer relates to the party's rebuttal, the admission or answer shall be filed prior to the close of testimony of the party's case-in-rebuttal. Unless otherwise ordered by an examiner-in-chief, any written objection to the admissibility of an answer shall be filed within 15 days of service of the answer.

(b) A party may not rely upon any other matter obtained by discovery unless it is introduced into evidence under this subpart.

Dated: November 8, 1984.

Donald J. Quigg,

Acting Commissioner of Patents and Trademarks.

[FR Doc. 84-32145 Filed 12-11-84; 8:45 am]
BILLING CODE 3510-16-M

PATENT NOTICES

Certificates of Correction for the Week of Jan. 29, 1985

Re. 31,235	4,405,000	4,434,186	4,452,179
D. 274,776	4,407,694	4,436,873	4,454,787
4,093,859	4,410,742	4,437,757	4,455,188
4,298,626	4,411,985	4,439,123	4,456,178
4,320,488	4,413,343	4,439,504	4,456,495
4,346,227	4,417,652	4,440,701	4,456,668
4,356,329	4,419,011	4,441,814	4,456,945
4,360,826	4,420,773	4,443,691	4,457,283
4,369,398	4,420,966	4,443,714	4,458,385
4,378,354	4,421,428	4,444,081	4,458,427
4,387,713	4,424,314	4,444,179	4,459,539
4,391,183	4,426,548	4,445,191	4,459,804
4,394,383	4,427,093	4,445,586	4,462,434
4,394,657	4,427,424	4,447,660	4,462,460
4,396,524	4,429,604	4,448,566	4,466,047
4,397,795	4,431,185	4,448,686	4,466,088
4,400,467	4,432,745	4,449,739	4,467,872
4,401,509	4,433,084	4,450,787	4,473,955
4,403,416	4,433,712	4,451,770	4,481,153

Disclaimers

3,510,062.—*Donald J. Waldman,* Peoria, Ill. DELIVERY VALVE FOR ENGINE FUEL PUMP. Patent dated May 5, 1970. Disclaimer filed Dec. 1, 1983, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,281,749.—*Mark John Fogelberg,* Muncie, Ind. AUTOMATIC LOCKING CLUTCH. Patent dated July 30, 1981. Disclaimer filed Nov. 9, 1984, by the assignee, *Borg-Warner Corp.*

Hereby enters this disclaimer to claims 46, 47 and 48 of said patent.

4,356,299.—*Michael S. Cholod,* Cornwells Heights, Pa. and *Nipun M. Shah,* Fayetteville, N.C. CATALYST SYSTEM FOR A POLYETHYLENE TEREPHTHALATE POLYCONDENSATION. Patent dated Oct. 26, 1982. Disclaimer filed Aug. 8, 1983, by the assignee, *Rohm and Haas Co.*

Hereby enters this disclaimer to claims 1 through 24 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: University of Massachusetts Library	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 22, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-20-81
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-11-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	3-28-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-06-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-08-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	2-18-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	2-23-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-12-80
DESIGN, GROUP 290—K. L. CAGE, Director	9-17-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	4-17-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-13-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	11-1-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	9-02-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	12-04-81

Expiration of patents: The patents within the range of numbers indicated below expire during December 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,355,744 to 3,360,799, inclusive

Plant Patents ..... Numbers 2,781 to 2,783 inclusive

REISSUES

JANUARY 29, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

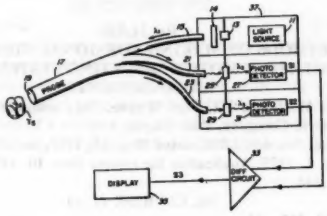
Re. 31,815
METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF CARIES IN TEETH USING VISIBLE LUMINESCENCE

Robert R. Alfano, Bronx, N.Y., assignor to Philips Medical Systems, Inc., Shelton, Conn.

Original No. 4,290,433, dated Sep. 22, 1981, Ser. No. 67,771, Aug. 20, 1979. Application for reissue May 24, 1982, Ser. No. 381,170

Int. Cl.³ A61B *6/00*

U.S. Cl. 128—665 33 Claims



1. A method for detecting the presence of caries in the teeth of a person comprising:

(a) exciting a region of the teeth to be examined with a beam of light that is at least substantially monochromatic,

(b) measuring the intensity of the visible luminescence emitted from the region at two predetermined wavelengths, one where the relative intensity dependence of the spectra is about the same for caries and non-decayed regions and the other where the intensity [increases] *changes* measurably in the presence of caries, and

(c) determining if caries is present in accordance with said measurements.

Re. 31,816
METHOD OF INCREASING THE SPECIFIC VOLUME OF TOBACCO RIBS

Waldemar Wochnowski, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Original No. 4,298,012, dated Nov. 3, 1981, Ser. No. 898,337, Apr. 20, 1978. Application for reissue Jun. 8, 1983, Ser. No. 502,155

Claims priority, application United Kingdom, Apr. 26, 1977, 17428/77

Int. Cl.³ A24B *3/18*

U.S. Cl. 131—296 12 Claims

1. A method of increasing the specific volume of tobacco ribs which are separated from tobacco leaf laminae, comprising the steps of conveying a stream of ribs along a predetermined path; agitating the ribs including subjecting the ribs to the action of steam which is conveyed upwardly across said path to cause the ribs of said stream to float in the ascending steam; condensing the steam on the external surfaces of the ribs to thereby wet such external surfaces and to cause release of heat as a result of condensation; effecting penetration of released heat and of condensate into the interior of ribs; maintaining said action for an interval of the time which suffices to cause evaporation of moisture in and resulting expansion of ribs; and rolling, severing and drying the expanded ribs immediately upon completion of said maintaining step.

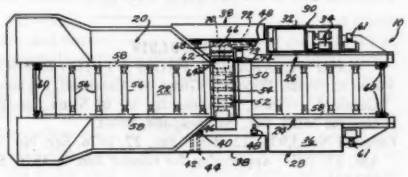
Re. 31,817
RAISIN SEPARATING DEVICE

Douglas H. Melkonian; Mark S. Melkonian, both of 6058 E. Butler, Fresno, Calif. 93727; Dennis J. Melkonian, 8336 E. North Ave., Sanger, Calif. 93657, and Suren M. Melkonian, 6058 E. Butler, Fresno, Calif. 93727

Original No. 4,267,930, dated May 19, 1981, Ser. No. 15,936, Feb. 28, 1979. Application for reissue Apr. 13, 1983, Ser. No. 484,547

Int. Cl.³ B07C *5/02*

U.S. Cl. 209—3.1 18 Claims



15. A method for separating moldy raisins from a mixed batch of moldy raisins and unspoiled raisins, comprising the steps of:

immersing said mixed batch of raisins and unspoiled raisins, a sufficient amount of time to make the moldy raisins substantially softer than the unspoiled raisins;

loading said mixed batch of raisins in a bulk mass onto a surface of an inclined, resilient moving conveyor, said conveyor having an upper portion and a lower portion;

agitating said conveyor at a predetermined frequency whereby the difference in resilience of the moldy raisins and unspoiled raisins will cause the firmer unspoiled raisins to bounce progressively off the lower portion of the inclined conveyor in a series of bounces while the softer moldy raisins move in the direction of movement of the conveyor; and

removing said softer raisins from said surface.

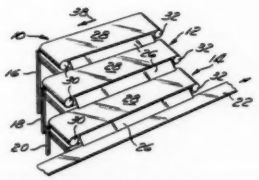
Re. 31,818
FEEDER CRUSHER

David Clonch, Bristol, Va., assignor to S & S Corporation, Cedar Bluff, Va.

Original No. 4,073,445, dated Feb. 14, 1978, Ser. No. 746,819, Dec. 1, 1976. Application for reissue May 31, 1979, Ser. No. 44,266

Int. Cl.³ B02C *13/30*

U.S. Cl. 241—101.7 18 Claims



1. A feeder-crusher machine for use in low clearance mines comprising an elongated low-profile body supported from the ground on traction means so as to be movable along the ground longitudinally, said body having side walls and a bottom and including, in end-to-end relationship along the length of the machine, a receiving section, a crushing section and a dis-

charge section; said crushing section including a rotary crusher shaft mounted transversely in said body and carrying a plurality of radial breaker arms the outer ends of which define a circle spaced from a wall of the machine; means for urging material residing on said bottom in said receiving section to the space between said circle and said wall so as to be crushed therein and for urging the resulting crushed material along the discharged section in a direction away from said crusher section; and drive means mounted on said body for rotating said crusher shaft, said drive means including a constant-speedmotor, a mechanical speed reduction unit having a high speed input driven by said motor, a low speed output driving said crusher shaft, a gear system connected between the input and the output for rotating the output at a speed proportional only to the speed of the input and a flywheel connected to rotate with said high speed input to said speed reduction unit whereby amplified torque produced by the high speed flywheel is transmitted through the gear connections in said reduction unit to the more slowly rotating crusher shaft.

Re. 31,819

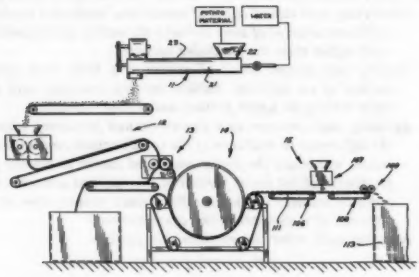
CHIP SEPARATING FROM A FRIED RIBBON

Verne E. Weiss, Wayzata; Glenn M. Campbell, Plymouth, and Gerald L. Wilson, Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Original No. 3,935,322, dated Jan. 27, 1976, Ser. No. 355,260, Apr. 27, 1973. Application for reissue Jun. 2, 1976, Ser. No. 692,054

Int. Cl.³ A23L *1/01*

U.S. Cl. 426—439 **12 Claims**



11. A method of preparing chip-type snacks comprising:

(1) mixing a farinaceous material and water to form a farinaceous dough, said water being present in an amount sufficient to provide a dough having sufficient cohesiveness to stick together as a sheet, the moisture content of said dough being about 25 to 45 percent by weight;

(2) forming the dough into a ribbon having alternating wide portions and narrow portions;

(3) frying the ribbon of dough in an oil bath, said oil bath having an entrance and an exit, said ribbon being conveyed through said oil bath from said entrance to said exit and said ribbon extending continuously from said entrance to said exit, thereby frying said ribbon;

(4) molding said ribbon between a pair of surfaces during the drying of step (3), such that said ribbon assumes the shape of a U, the U shape being the cross section facing in the direction of advance of the ribbon, whereby chips resulting from separating the ribbon at the narrow portions will be round or oval or similarly shaped and will have a U-shaped cross section;

(5) removing the shaped fried ribbon from said oil bath and substantially changing the direction of the path of travel of said shaped fried ribbon to bend said shaped fried ribbon; and then

(6) separating the ribbon at the narrow portions to provide individual chips which are round or oval or similarly shaped and are of U-shaped cross section.

Re. 31,820

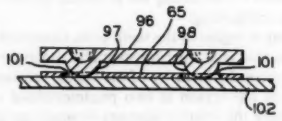
METHODS OF MAKING TORSIONAL VIBRATION ISOLATING MOTOR MOUNTING SYSTEMS AND ARRANGEMENTS

Ernest W. Litch, III, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Original No. 4,063,060, dated Dec. 13, 1977, Ser. No. 636,547, Dec. 1, 1975. Application for reissue Dec. 10, 1979, Ser. No. 101,846

Int. Cl.³ B23K *11/14*

U.S. Cl. 219—93 **18 Claims**



16. A method of manufacturing a torsionally flexible vibration isolating electric motor mounting arrangement comprising first and second weldable members that cooperate as heat sink means, and a flexible mounting arm formed from a martensitic type of steel and having a motor end, said method comprising: positioning together the flexible mounting arm, and first and second weldable members, and trapping the motor end of the flexible mounting arm between the first and second weldable members; passing welding current through the first and second weldable members while urging the first and second weldable members toward one another, thereby to weld the first and second weldable members together at at least two spaced apart interfaces therebetween, and dissipating welding heat caused by the welding current along the heat sink means whereby excessive heating of the mounting arm is minimized, thereby to avoid destruction of the martensitic type of steel strength characteristics of the mounting arm.

PLANT PATENTS

GRANTED JANUARY 29, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,396

CLIMBER ROSE PLANT—METZALITAF VARIETY

Marie L. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 28, 1983, Ser. No. 508,717
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—2 **1 Claim**

1. A new and distinct variety of Climber rose plant, substantially as illustrated and described, characterized particularly by (a) a vigorous well branched growth habit with long arching canes, (b) buds which open into extremely attractive relatively large blossoms of a richly colored yellow-rouge blend, and (c) attractive leathery and glossy foliage of deep green coloration.

5,397

MINIATURE ROSE PLANT CV AROPRAWN

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 10, 1983, Ser. No. 503,047
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid miniature class, substantially as herein shown and described, and being especially characterized in that its consistently classically formed flowers are produced in good proportion to the foliage and plant; its abundant and nearly continual production of flowers borne both singly and in clusters, well above the foliage; its consistently low, round, well-branched bush; its attractive and abundant semi-glossy foliage clothes even the lower branches and in its unique petal coloration of soft cream edge with a delicate pink.

5,398

ROSE PLANT CV. AROWEDYE

Jack E. Christensen, and Herbert C. Swim, both of Ontario, Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 10, 1983, Ser. No. 503,046
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class, substantially as herein shown and described, being particularly characterized by large pointed buds that are usually produced singly on long strong stems; its clear yellow coloration lasts throughout the life of the bloom and longer than most other yellow roses; its large blooms open very slowly and are uniquely (for yellow rose cultivars) long-lasting in the garden and in the vase; it is significantly more vigorous than most other yellow roses and provides an attractive, easy-to-grow garden specimen; its flowering stems are long and low-thorned, and it has an abundance of large foliage during the growing season.

5,399

ROSE PLANT CV. AROJECHS

Jack E. Christensen, and Herbert C. Swim, both of Ontario, Canada, assignors to Armstrong Nurseries, Inc., Ontario, Canada

Filed Jun. 10, 1983, Ser. No. 503,045
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of Floribunda rose plant cv. Arojechs, substantially as herein shown and described, and being especially characterized in the unique multicoloration of the flowers which is basically yellow blushing to orange and finishing red; in the abundance of its glossy foliage, which covers the entire bush; in the abundance and nearly continuous production of flowers distributed well over the tall bush, in its ability to continue to flower despite the presence of maturing hips, and in its high level of disease resistance and overall vigor.

PATENTS

GRANTED JAN. 29, 1985

ERRATA

For CLASS	See PATENT NO.
052–023	4,495,843
297–118	4,495,587
128–419	4,495,917
128–130	4,495,934
384–474	4,496,199
225–065	4,496,276
273–249	4,496,327
534–794	4,496,480
534–579	4,496,481
534–577	4,496,482
514–012	4,496,521
514–019	4,496,540
514–002	4,496,541
514–002	4,496,542
514–011	4,496,543
514–013	4,496,544
514–016	4,496,545
514–029	4,496,546
514–025	4,496,547
514–027	4,496,548
514–027	4,496,549
514–054	4,496,550
514–063	4,496,551
514–147	4,497,552
514–166	4,496,553
514–179	4,496,554
514–182	4,496,555
514–178	4,496,556
514–211	4,496,557
514–213	4,496,558
514–188	4,496,559
514–204	4,496,560
514–209	4,496,561
514–207	4,496,562
514–222	4,496,563
514–237	4,496,564
514–222	4,496,565
514–254	4,496,566
514–272	4,496,567
514–301	4,496,568
514–311	4,496,569
514–282	4,496,570
514–340	4,496,571
514–337	4,496,572
514–344	4,496,573
514–195	4,496,574
514–390	4,496,575

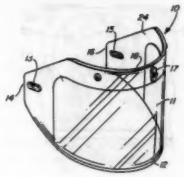
For CLASS	See PATENT NO.
514–389	4,496,576
514–392	4,496,577
514–423	4,496,578
514–411	4,496,579
514–443	4,496,580
514–438	4,496,581
514–450	4,496,582
428–288	4,496,583
514–510	4,496,584
514–514	4,496,585
514–531	4,496,586
514–573	4,496,587
514–564	4,496,588
514–565	4,496,589
514–646	4,496,590
514–477	4,496,591
562–443	4,496,703
548–455	4,496,719
337–006	4,496,919

PATENTS

GRANTED JANUARY 29, 1985

GENERAL AND MECHANICAL

4,495,657
HELMET SHIELD APPARATUS
William P. Bay, Rte. 1, Box 53, Ormond Beach, Fla. 32074
Filed Sep. 30, 1982, Ser. No. 428,688
Int. Cl.³ A61F *9/04*; A63B *71/10*
U.S. Cl. 2—10 **11 Claims**

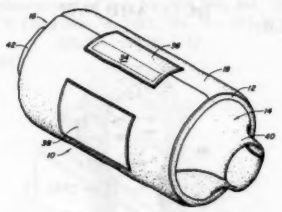


1. A helmet snap on shield comprising in combination:
a transparent shield shaped to fit onto a helmet and having two sides and a top, bottom and two end edges;
a polymer center snap fastener portion formed in said shield adjacent the top edge of said shield; and
a pair of side polymer snap fastener portions formed in said shield, one located adjacent each end side edge of said shield, each said side polymer snap fastener portion having an elongated groove having an elongated lip formed along each elongated edge of said groove and protruding over a portion of said groove, said elongated lips having a predetermined shape to receive a male snap fastener portion therein along said elongated groove, said pair of side polymer snap fastener portions having a back portion thereto protruding from the front of said transparent shield, whereby said helmet shield can be fitted to different helmets having male fastener portions in different positions.

4,495,658
BIB HAVING A DUPLEX REFASTENABLE TAPE-TAB FASTENER
David M. Moret, and Nicholas A. Ahr, both of Cincinnati, Ohio, assignors to The Procter and Gamble Company, Cincinnati, Ohio
Filed Feb. 10, 1983, Ser. No. 465,237
Int. Cl.³ A41B *13/10*
U.S. Cl. 2—49 R **10 Claims**

2. A bib comprising a body member of sheet material having a front surface and a back surface, two separability members of sheet material each having a front face and a back face, and an adhesive-faced tape-tab fastener, said body member being comprised of material which obviates refastenable application of said tape-tab fastener directly to the front surface of said body member, said body member having a neck-accommodating aperture disposed adjacent the top end thereof and having a cut extending from the edge defining said aperture to an adjacent outer edge of said body member, said separability members comprising material which enables oppositely disposed end portions of said tape-tab fastener to be refastenably adhered to said from faces, said separability members being non-releasably secured to said front surface of said body member and so disposed that they are on opposite sides of said cut and adjacent thereto, said tape-tab fastener having one surface coated with an adhesive which enables refastenable adhesion to said front faces of said separability members, and said tape-tab fastener being configured and disposed to bridge across said cut and to bridge between said separability members when said end portions of said tape-tab fastener are adhesively secured to said front faces thereof.

4,495,659
COLD-WEATHER MUFF
Herman Madnick, and Ralph F. Goldman, both of Framingham, Mass., assignors to Multi-Tech Corporation, Natick, Mass.
Filed Nov. 1, 1983, Ser. No. 547,754
Int. Cl.³ A41D *5/00*
U.S. Cl. 2—66 **14 Claims**

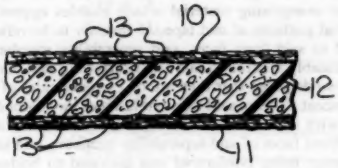


1. A cold-weather muff, comprising:
first means defining a generally cylindrical insulative tube having a longitudinally extending channel and opened ends;
second means disposed in said longitudinally extending channel for providing a left hand receiving pocket having an open end in communication with one of said opened ends of said insulative tube and having a sealed end terminating inside said longitudinally extending channel;
third means disposed in said longitudinally extending channel for providing a right hand receiving pocket having an open end in communication with the other one of said opened ends of said insulative tube and having a sealed end terminating inside said longitudinally extending channel; and
fourth means disposed in said longitudinally extending channel for providing a chamber intermediate said left hand receiving and right hand receiving pockets dimensioned to accept a chemical heating element.

4,495,660
NECK GARMENT
Sharon M. Hayden, 14448 Garden, Livonia, Mich. 48154
Filed Apr. 14, 1983, Ser. No. 484,898
Int. Cl.³ A41D *23/00*
U.S. Cl. 2—91 **4 Claims**

1. A garment for insulating the head, neck, chest and shoulder areas of a person, said garment comprising a muffler portion and an integrally depending apron portion formed of a single piece of elastically stretchable material, said single piece of elastically stretchable material having two edges disposed substantially parallel to each other along said muffler portion of said garment and arcuately diverging away from each other

along said apron portion of said garment when laid open flat, said garment further comprising a set of inter-engageable fastening means, wherein each portion of said set of fastening



means is disposed proximate one of said edges of said piece of material and extends across substantially the entire distance thereof such that engagement of said fastening means holds said piece of material in a tubular configuration.

4,495,661

COMPOSITE INTERLINING MATERIAL

Dattatraya V. Kamat, Yardley, Pa., assignor to Crown Textile Company, Jenkintown, Pa.

Filed Mar. 28, 1983, Ser. No. 479,441
Int. Cl.³ A41D *27/02*
U.S. Cl. 2—97 **5 Claims**

1. A garment panel comprising a base fabric cut to the desired shape for being connected to other panels to form the garment, and a bulky and lightweight composite interlining material attached to the inner surface of said base fabric for providing bulk and durability thereto, said interlining material comprising a first outside layer of fabric, a second outside layer of fabric, at least one of said outside layers of fabric comprising a nonwoven batt of fibers, a middle layer of foam material sandwiched between said first and second outside layers, and means adhesively connecting the adjacent surfaces of said first and second outside layers of fabric to the opposed surfaces of said middle layer of foam material to form the composite interlining material, the total weight of said composite interlining material being within the range of approximately three to seven ounces per square yard, said foam material providing bulk and resiliency to said interlining material, and said first and second outside layers of fabric providing smooth and nonabrasive surfaces to said interlining material and while restricting the normal tendency of said foam material to stretch and tear.

4,495,662

NIGHTTIME GARMENT FOR OSTOMY POUCH USER

Janine Miller, 43 Ardale Rd., Paramus, N.J. 07652

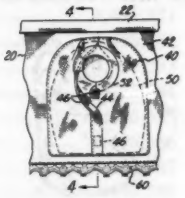
Filed Sep. 24, 1982, Ser. No. 423,161
Int. Cl.³ A41D *1/14, 27/20;* **A61F** *5/44*
U.S. Cl. 2—211 **9 Claims**

1. A nighttime garment to be worn by a person for concealing an ostomy pouch used by the person, the ostomy pouch having a neck, the garment comprising:

a wrap-around skirt-like member including a waist portion and a depending skirt portion, the skirt portion having an inner surface and an opposite outer surface;

a pocket on the inner surface;

securing means at the waist portion for securing the skirt-like member at the waist of the person, with the skirt-like member wrapped around the person, the inner surface confronting the person, and the pocket juxtaposed with the ostomy pouch;



an opening in the pocket for passing the ostomy pouch therethrough; and

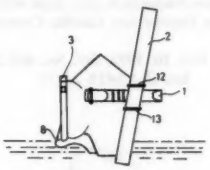
a closure for selectively closing at least a portion of the opening, while a further portion of the opening remains unclosed, for securing the ostomy pouch within the pocket, concealed behind the outer surface of the skirt portion, with the ostomy pouch resting in the pocket and the neck of the ostomy pouch extending through the unclosed further portion of the opening.

4,495,663

STRAP FOR USE WITH DIVING GOGGLES

Steve Shieh, 2-6th Fl. 13, Lane 118, Chung Ching S. Rd., Sec. 1, Taipei, Taiwan (100)

Filed Aug. 20, 1982, Ser. No. 410,179
Int. Cl.³ A42B *1/24;* **A61F** *9/02;* **A63B** *33/00*
U.S. Cl. 2—422 **1 Claim**



1. A strap for use with a pair of diving goggles and an aspiration pipe, the strap comprising:

an elongated member having first and second ends releasably connected to the pair of goggles, each end having an upper and a lower edge;

an arm integrally connected to both the upper and the lower edges of one of the ends of the strap, the longitudinal axes of the arms being coextensive with each other and disposed obliquely with respect to the upper and lower edges; and

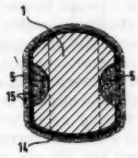
a ring integrally attached to the free end of each arm, the rings being adapted to support the aspiration pipe at an oblique angle relative to the strap when the rings are at substantially right angles to the arms so the aspiration pipe will in use tend to be substantially perpendicular to water level to minimize the chance of water entering the open end of the aspiration pipe.

4,495,664

TITANIUM OR TITANIUM ALLOY PIN FOR CEMENT-FREE FIXING IN A LONG BONE TO FORM A PROSTHESIS

Daniel Blanquaert, Paris, France, assignor to Ceraver, Paris, France

Filed Jul. 28, 1982, Ser. No. 402,699
Claims priority, application France, Jul. 30, 1981, 81 14841
Int. Cl.[3] A61F 1/04, 5/04
U.S. Cl. 3—1.913 6 Claims



1. A pin of titanium or titanium alloy for cement-free fixing in a long bone to form a prosthesis of a joint or for bone repair, surrounded by a lattice of titanium wire with a mesh size of at least 0.3 mm, wherein said pin and said lattice are coated with a coating of titanium oxide which protects them against long-term corrosion, and said lattice is further coated with an outer coating of a biodegradable and biocompatible material having a low modulus of elasticity and wherein said coating of said biodegradable and biocompatible material extends 0.3 to 1.5 mm beyond the envelope of said lattice thereby protecting said lattice during the fitting of the pin into the bone repair site.

4,495,665

POSTERIOR CHAMBER INTRAOCULAR LENS AND METHOD OF MAKING AN OPENING IN A CAPSULE

Charles D. Kelman, 269 Grand Central Pkwy., Floral Pk., N.Y. 11005

Filed Jan. 4, 1983, Ser. No. 455,537
Int. Cl.[3] A61F 1/16, 1/24
U.S. Cl. 3—13 10 Claims

1. A posterior chamber intraocular lens comprising:

a lens body including a rear surface having thereon at least two projections together having a total length along said rear surface in a direction transverse to the distance between said projections which is small relative to said distance between said projections; and

position-fixation means extending from said lens body for positioning said lens body in the capsule of an eye and for pressing said projections against the posterior capsule, each of said projections shaped so as to make substantially single point contact with said posterior capsule and said projections being effective to cause tension of the posterior capsule in said region between at least two of said projections sufficient to tear the posterior capsule after perforation of the capsule in said region between at least two of said projections.

9. A method of making an opening in the posterior capsule of an eye comprising:

inserting into the capsule of an eye an intraocular lens having spaced projecting portions on the rear surface of the lens body, said projecting portions together having a total length along said rear surface in a direction transverse to the distance between said projecting portions which is small relative to the distance between said projecting portions, each of said projecting portions shaped so as to make substantially single point contact with said posterior capsule thereby causing said projecting portions to press against the posterior capsule for forming at least one line of tension in the posterior capsule in the region between said projecting portions; and

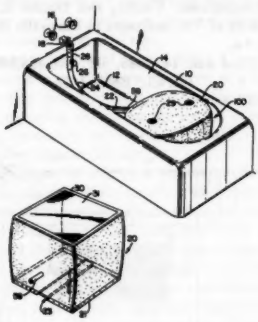
perforating the posterior capsule with a laser beam in a direction transverse to the line of tension of the posterior capsule, whereby the posterior capsule tears to form an opening.

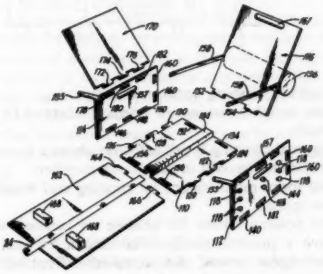
4,495,666

BATHTUB CUSHION LIFT ASSEMBLY

Harry H. Herman, Jr., Chevy Chase, Md., assignor to International Healthcare Products, Inc., Washington, D.C.

PCT No. PCT/US81/00290, § 371 Date Mar. 1, 1983, § 102(e) Date Mar. 1, 1983, PCT Pub. No. WO82/03002, PCT Pub. Date Sep. 16, 1982
Continuation-in-part of Ser. No. 054,794, Jul. 10, 1979.
PCT Filed Mar. 9, 1981, Ser. No. 483,301
Int. Cl.[3] A47K 3/12
U.S. Cl. 4—564 30 Claims





1. A bathtub lift assembly for use in a bathtub including a bathtub lift adapted to be disposed in and supported by the bathtub and having a seat for supporting a bather, means for positioning said seat at any selected elevation intermediate a first position substantially coplanar with the rim of the side walls of the bathtub and a second position adjacent to the floor of the bathtub, at least one side plate adapted to be disposed

adjacent to the interior surface of a bathtub side wall, means for releasably maintaining said side plate in a stationary relation with respect to the adjacent bathtub side wall, and means associated with said side plate against which the bather may apply a force to aid his locomotion in the vicinity of the bathtub.

15. A bathtub lift assembly for use in a bathtub including a floor plate adapted to be disposed adjacent to the bathtub floor, a bathtub lift adapted to be supported by said floor plate and having a seat for supporting a bather, means for positioning said seat at any selected elevation intermediate a first position substantially coplanar with the rim of the side walls of the bathtub and a second position adjacent to the floor plate, a floor mat adapted to be disposed adjacent to the floor of the bathtub beside said floor plate, and means for maintaining said floor mat in a stationary relation with respect to said floor plate, and means for connecting said floor plate to said floor mat.

17. In a cushion lift assembly for use in a bathtub having a floor and side walls, said assembly having a water inflatable cushion shell of flexibly substantially non-elastic material with side wall portions compressively engaging the bathtub side walls, the improvement comprising:

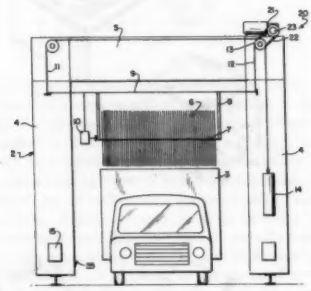
a bottom panel of said assembly being adapted to be disposed in interfacial engagement with the floor of said bathtub and having a substantially rigid portion for substantially preventing displacement of the cushion shell in the bathtub during use.

4,495,667

VEHICLE WASHING APPARATUS

James W. Roncaglione, Vienna, and Daniel E. Roncaglione, Chatham, both of Va., assignors to Caravelle Industries, Inc., Manassas, Va.

Filed Jan. 14, 1983, Ser. No. 458,099
Int. Cl.³ B60S *3/06*
U.S. Cl. 15—53 A **3 Claims**



1. A vehicle washing apparatus, comprising:

a frame member having an opening adapted to receive a vehicle;

a horizontal cleaning brush rotatable about a horizontal axis of rotation disposed in said frame member;

contant speed motor means for rotating said brush at a constant speed;

current sensing means for sensing an increase in current above a predetermined value drawn by said constant speed motor means, said increased current being caused by a greater than desired pressure contact between said brush and said vehicle;

vertically adjustable mounting means for adjustably mounting said brush in said opening;

counterweight means for partially counterweighting said brush and said vertically adjustable mounting means wherein said brush naturally descends under the force of gravity and contacts said vehicle being washed, said counterweight means allowing said rotating brush to descend into contact with said vehicle to achieve desired pressure contact between said brush and said vehicle;

a brush lifting motor responsive to said current sensing means for lifting said vertically adjustable mounting means against the excess weight of said counterweight means when said current exceeds said predetermined value;

clutch means responsive to said current sensing means for operably connecting said brush lifting motor with said vertically adjustable mounting means, said clutch means being actuated to transmit torque from said brush lifting motor to said vertically adjustable mounting means when said current exceeds said predetermined value; and

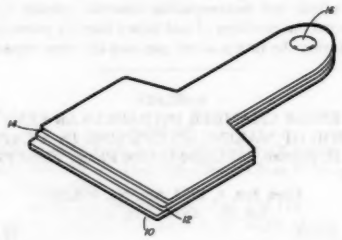
movement means responsive to said current sensing means for causing relative movement in a first horizontal direction between said frame member and said vehicle during a representative cleaning cycle wherein said movement means is actuated when said current is below said predetermined value and said movement means is not actuated when said current is above said predetermined value.

4,495,668

MULTISTATE PRECIPITATION REMOVAL TOOL

Bruce M. Adams, 704 Felipe Pl., Sante Fe, N. Mex. 87501

Filed Sep. 27, 1982, Ser. No. 424,388
Int. Cl.³ A47L *1/06*
U.S. Cl. 15—105 **24 Claims**



1. A tool for removing ice, snow and slush from delicate surfaces, polishing frost, and squeegeeing water thereon without damage to these surfaces, which tool comprises in combination:

a. a plurality of substantially parallel blade members, each of said blade members having a substantially constant, chosen flexibility, said blade members varying in flexibility from soft to stiff, each having a leading edge for scraping and a second edge, each being adapted to be held by hand, said leading edge of the softest of said blade members protruding forward of that of the next stiffest blade member lying next to it, said stiffer blade members being recessed in a stepwise manner from soft to stiff; and

b. means for rigidly and detachably fastening said blade members, said fastening means being spaced apart from said leading edges of said blade members.

4,495,669

DUAL-GRIP HANDLE BRUSH FOR PAINTING AND THE LIKE

Roger Hooper, P.O. Box 14271, Baton Rouge, La. 70898

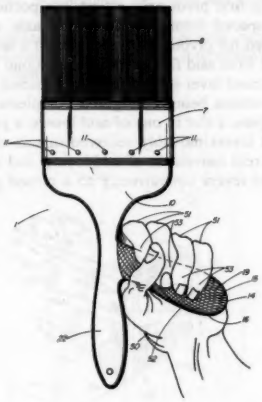
Filed Jan. 6, 1983, Ser. No. 456,246
Int. Cl.³ A46B *5/02*
U.S. Cl. 15—143 R **7 Claims**

1. A dual-grip paint brush comprising:

a. a brush body portion having a brushing means and a sheath for securably holding said brushing means, said sheath having a central axis;

b. a longitudinally elongated handle member extending

along said central axis of said sheath, said handle member comprising an enlarged portion attached to said sheath, a neck portion, and a hand gripping portion connected to said neck portion;



c. a pistol-grip handle connected to said neck portion, said pistol-grip handle extending outwardly away from said brushing means at an angle of approximately 60° with respect to said central axis.

4,495,670

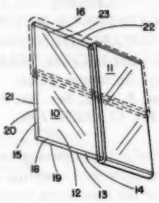
HAND-HELD SCRAPER

Alan J. Baker, 346 E. Mulberry St., Lancaster, Ohio 43130

Continuation of Ser. No. 409,422, Aug. 23, 1982, abandoned. This application Jan. 31, 1983, Ser. No. 462,520

Int. Cl.³ A47L *1/06;* **B60S** *1/04*

U.S. Cl. 15—236 R **6 Claims**



1. A two piece hand-held scraper comprising:

(a) a plate-like structure having a pair of relatively opposing, predominantly smooth, equilateral faces and forming therewith a plurality of rigid working edges of equal length completely bordering each of said equilateral faces; and

(b) a hand guard provided with an elongated cavity for selectively and removably receiving each of the side surfaces of said plate-like structure and the working edges immediately adjacent to the selected side surface, said cavity sized to fit snugly about said surfaces and said hand guard composed of a flexible material to removably adhere to said plate-like structure, the removal and placement of said hand guard about said side surfaces changing said working edges to be used for scraping.

4,495,671

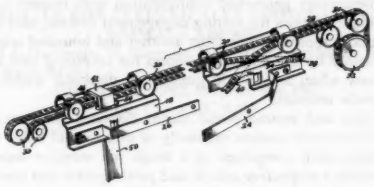
MASTER CARRIER AND PERFORATED TAPE DRIVE COMBINATION

Paul E. Comeau, Warwick, and Anthony Torti, Cranston, both of R.I., assignors to Kenney Manufacturing Company, Warwick, R.I.

Filed Dec. 6, 1982, Ser. No. 447,268

Int. Cl.³ A74H *5/032*

U.S. Cl. 16—87 R **2 Claims**



1. A tape-drive and master carrier combination for telescoping traverse rods for curtains comprising:

(a) a hollow traverse rod including a pair of elongated adjustable telescoping tubes each of a given length adapted to be mounted on a wall;

(b) a first and second master curtain carrier mounted in said rod for longitudinal motion relative thereto from respectively fully opened to fully closed positions;

(c) a length of a flexible, uniformly perforated, essentially non-stretchable, drive-tape for said master carriers;

(d) a toothed drive-sprocket for driving said tape with the teeth of said sprocket fitting in positive driving relation into the perforations in said tape;

(e) pulley means at each end of said rod;

(f) said drive-tape in said tubes in the form of a loop passing over the pulley means at each end of said rod, said loop having an upper leg extending the length of said rod and a lower leg formed by two free ends of said loop terminating at said first master carrier;

(g) adjustable means at said first master carrier accessible from outside of said rod for securing said ends of said tape loop to said first master carrier whereby slack may be substantially removed from said loop after telescoping adjustment of the length of said rod has been made;

(h) adjustable means at said second master carrier accessible from the outside of said rod for securing said second master carrier to the upper leg of said tape loop at a point on said upper leg which corresponds to the fully opened position of said second master carrier when the first master carrier is in the first master carrier's fully opened position; the adjustable means (h) at the second master carrier comprising a locking detent mounted on a control arm, means for slidably interconnecting the control arm and the second master carrier so that said locking detent can be placed in locking relation in a perforation in the upper leg of said tape loop, and the control arm extending through the second master carrier to the outside of said rod so that the second master carrier can be locked to the tape by operation of the control arm from the outside of said rod.

4,495,672

HINGE LATCH

Mark J. Adams, Bainbridge Island, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/00244, § 371 Date Feb. 22, 1983, § 102(e) Date Feb. 22, 1983, PCT Pub. No. WO84/03325, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 22, 1983, Ser. No. 491,954

Int. Cl.³ E05D *7/10, 15/50*

U.S. Cl. 16—229 **11 Claims**

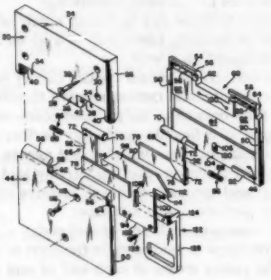
1. A hinge latch configured for selectively releasable, pivot-

able hinging securement of one structural member moveable relative to another cooperative structural member, comprising:

(a) a first hinge latch plate in operative association with a first structural member, having a pair of transverse pintle recesses separated one from another and bounded intermediately by a hinge boss including hinge bores disposed transversely toward said pintle recesses;

(b) a second hinge latch plate in operative association with a second structural member moveable relative to said first member, having a pair of transverse pintle guides of complementary geometric configuration with respect to said pintle recesses for mating engagement therein, said pintle guides separated one from another and bounded intermediately by a pintle guide recess for receiving said hinge boss when said pintle guides are disposed within said pintle recesses;

(c) first and second pintle means disposed for transverse reciprocable motion interiorly of said second hinge latch plate, each comprised of a hinge pin member received within a respective one of said pintle guides and having a free distal end for projection within a respective one of



said hinge bores for pivotal hinging movement of said first and second latch plates about a transverse axis and a hinge pin plate secured to said hinge pin member disposed in guiding receipt within a cooperative plate slot interiorly of said second hinge latch plate and having a lateral leg terminating at its distal end in a diagonally disposed abutment edge;

(d) biasing means for urging each of said pintle means into a normal hinging configuration with said hinge pins disposed within said hinge bores; and,

(e) latch actuator means received interiorly of said second hinge latch plate for lateral movement therein, having an actuator stem and a generally trapezoidal head including opposed, diagonally disposed abutment edges for mating engagement with the abutment edges of said first and second pintle means;

wherein lateral displacement of said actuator stem with an unlatching force is translated across said abutment edges to a transverse force displacing said hinge pins transversely out of engagement with said hinge bores releasing said hinge latch plates.

4,495,673

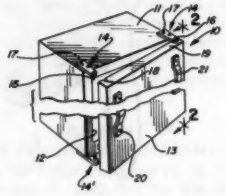
DOUBLE-ACTING REFRIGERATOR DOOR HINGE WITH DUAL LATCH MEMBERS

Aman U. Khan, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 29, 1982, Ser. No. 427,114
Int. Cl.³ E05D *15/50*
U.S. Cl. 16—232 **9 Claims**

1. In an enclosure having a cabinet defining an access opening with a pair of hinge pins disposed on the cabinet at laterally opposite sides of the opening, and a closure door for selectively closing the opening, improved means for mounting the door to the opposite hinge pins for selective opening of the door from either side of the opening, said mounting means comprising:

a pair of hub structures on the door removably associated one each with said hinge pings, each said hub structure comprising a first lever mounted for pivotal movement about a first pivot axis, a first hub portion on said first lever spaced from said first pivot axis, a second lever mounted for pivotal movement about a second pivot axis spaced from said first pivot axis, a second hub portion on said second lever spaced from said second pivot axis, said hub portions being configured complementarily to said hinge pins, a slot in one of said levers, a pin on the other of said levers movably received in said slot for causing concurrent movement of said levers, and means for biasing said levers concurrently to a closed position where



said hub portions are juxtaposed to fit about and pivotally capture an associated hinge pin and to an open position wherein said hub portions are spaced apart to permit lateral withdrawal of the associated hinge pin; and

a rod longitudinally movable between said hub structures and having ends selectively engaging one lever of each of the respective hub structures for positively locking either hub structure in the closed position when the other hub structure is in the open position, wherein said means for biasing the levers comprising spring-biased detent means engaging one of said levers and said one of said levers including first and second cam surfaces which cooperate with said detent means to provide overcenter movement of said one of said levers between said open and closed positions.

4,495,674

CONCEALED DOOR HINGE HAVING A DOUBLE PIVOTAL MOUNTING

Louis A. Haddock, Jr., Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 5, 1982, Ser. No. 355,008
Int. Cl.³ E05F *1/08*
U.S. Cl. 16—302 **6 Claims**

5. The combination of a door opening having a jamb on one side, a door adapted to close said opening, and a hinge mechanism carrying the door for operation, comprising

a support bracket mounted in fixed spaced relation with said jamb,

said support bracket being inside when the door is closed,

a hinge member pivotally mounted on said support bracket and extending toward said jamb in the door closed position,

a link pivotally mounted on said support bracket and extending toward said jamb in the door closed position,

a pivot arm pivotally connected at the distal ends of said hinge member and said link,

a projection on said pivot arm,

a spring connected between said projection and said support bracket in a manner to bias said hinge member to move to an intermediate door position,

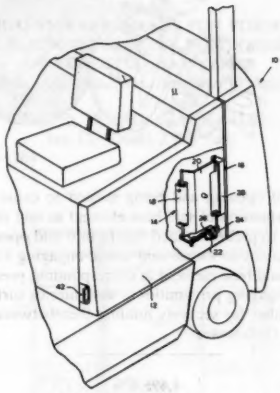
the distal end of said hinge member following an arcuate path having two components of motion during a move from the closed to the intermediate position, one compo-

nent being toward the center of said door opening from the jamb and the other outwardly of the door opening,

an abutment on said support bracket which is contacted by said hinge member when said intermediate position is reached,

a double pivotal mounting at the distal end of said hinge member,

said door mounted on said double pivotal mounting for swinging movement between said intermediate position and a fully open position,



an abutment on said pivot arm positioned to be contacted by said door as it moves from said intermediate position to said closed position causing said pivot arm to move to the door closed position,

a resilient stop on said hinge member which is contacted by said door when it reaches said closed position, and

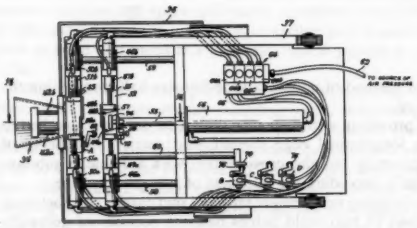
a latch on said door opposite said jamb selectively holding said door in the closed position.

4,495,675

METHOD AND APPARATUS FOR REMOVING MEAT FROM THE KNUCKLED END OF A BONE

Carl J. Hill, deceased, late of Ball Ground, Ga., and by Hazel R. Hill, executrix, Rte. 3, Box 229, Ball Ground, Ga. 30107

Filed Apr. 12, 1982, Ser. No. 367,249
Int. Cl.³ A22C *17/04, 21/00*
U.S. Cl. 17—1 G **13 Claims**



9. Apparatus for boning animal or poultry parts having an elongate bone with a knuckle joint at each end thereof, comprising:

holding means for holding said bone at one knuckle joint end;

a pair of blades for stripping the meat from said bone, said blades defining an opening adjustable to a first predetermined size to accommodate said animal or poultry part, a second predetermined size to accommodate the general diameter of the elongate portion of said bone, and a third predetermined size to accommodate the general diameter of the other knuckle joint; and

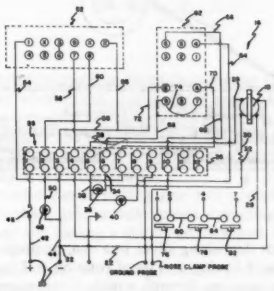
means for automatically adjusting the opening of said blade means between said three predetermined sizes in a single boning cycle, including means for moving only one of said blades for adjusting said opening from said second predetermined size to said third predetermined size.

4,495,676

APPARATUS FOR ELECTRICALLY STIMULATING AN ANIMAL CARCASS

Gerald J. Hartmetz, II, Harneds, Inc., 616 Pennsylvania, Wichita, Kans. 67202

Filed Aug. 2, 1982, Ser. No. 404,370
Int. Cl.³ A22C *9/00*
U.S. Cl. 17—25 **1 Claim**



1. An apparatus for electrically stimulating an animal carcass to tenderize the same comprising in combination a nose clamp means and an insert plug means for respectively engaging the animal carcass in proximity to the nose and the hock of the same, a housing, an electrical impulse-generating means positioned in said housing and electrically connected to said nose clamp means and said insert plug means, said impulse-generating means including a step-down transformer to reduce the input voltage from an alternating current power source to between 44 and 48 volts and the amperage to less than about 1 amps., said step-down transformer has a primary winding including one primary terminal connected to the alternating power source and another primary terminal connected to a point terminal strip means, the secondary winding of said step-down transformer includes a pair of secondary terminals that connect to said point terminal strip means, an interval cycle timer means electrically attached to said terminal connected to the alternating power source, and a repeat cycle pulsation timer means electrically connected to said terminal strip means for automatically controlling the on-off of the electric current to the carcass, said interval cycle timer means includes four interval terminals electrically engaged to said terminal strip means, and said repeat cycle pulsation timer means comprises five pulsation terminals electrically engaged to said terminal strip means, one of said interval terminals and one of said pulsation terminals connect to a common terminal on said terminal strip means; a resistor means engaging a secondary terminal, a first low voltage lamp means electrically engaging the secondary terminal having the resistor means to indicate when low voltage is available for stimulation, a second low voltage lamp means electrically engaged to the first low voltage lamp means and the point terminal strip means; a first switch means electrically engaging the terminal strip means; a second switch means electrically engaged to the first switch means and to the terminal strip means which when closed energizes step-down transformer and lights up the first low voltage lamp means; and a third switch means electrically

engaged to the second switch means and the terminal strip means which closed starts said interval timer means and said repeat cycle timer means.

4,495,677

METHOD AND APPARATUS FOR COILING FIBER SLIVER

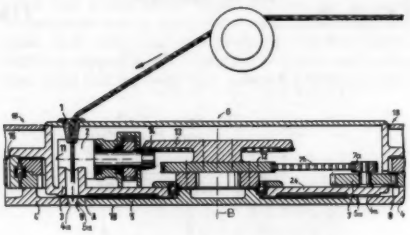
Albert Rosink, Nordhorn, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 480,116

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213397

Int. Cl.³ B65H *54/80*

U.S. Cl. 19—159 R **10 Claims**



3. A coiler for depositing sliver in a can, comprising

(a) a coiler head having an axis of rotation and including

(1) an inlet opening through which sliver enters into the coiler head;

(2) an outlet opening through which sliver leaves the coiler head; said outlet opening being provided eccentrically with respect to said rotary axis, whereby said outlet opening travels in a circular path upon rotation of said coiler head;

(3) sliver advancing means drawing sliver through said inlet opening and delivering sliver through said outlet opening;

(b) support means for supporting said coiler head for rotation about said axis;

(c) driving means for rotating said coiler head; and

(d) stationary means defining an annular chamber immediately adjoining said outlet opening and being in alignment with said circular path; said annular chamber having an open top oriented towards said outlet opening and an open bottom oriented away from said outlet opening; said sliver being received in said annular chamber through said open top and being discharged from said annular chamber through said open bottom.

4,495,678

BUTTON FOR RECEIVING AND SECURING A FABRIC COVERING THEREFOR AND FABRIC-COVERED BUTTON ASSEMBLY FORMED THEREWITH

Charles R. Coley, Blowing Rock, and J. Roger Hall, Hickory, both of N.C., assignors to Plus One Ltd., Blowing Rock, N.C.

Filed Apr. 11, 1983, Ser. No. 483,569

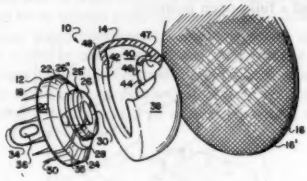
Int. Cl.³ A44B *1/12*

U.S. Cl. 24—113 R **18 Claims**

1. A button for receiving and securely holding in place a fabric covering therefor, comprising:

a. an expandable base element having a shaped fabric-engaging exterior surface portion and a second surface portion extending inwardly with respect to the periphery of said exterior surface portion, said base element being formed with an opening extending into said base element generally centrally of said exterior surface portion; and

b. a cap member formed of resilient material and having an interior surface portion shaped to receive said base element for engaging fabric therebetween, said cap member having an annular lip extending inwardly for disposition immediately adjacent said second surface portion of said base element to resist removal thereof from said cap member and having projection means extending generally centrally from said interior surface portion for insertion into said opening of said base element, said projection means having at least a portion thereof which is larger



than said opening and being shaped to cause increasing radial expansion of said base element as said projection is inserted to predetermined depths into said opening of said base element to locate said fabric-engaging exterior surface of said base element in corresponding predetermined fabric-engaging proximities to said interior surface of said cap member for securely holding therebetween fabrics of varying thicknesses.

4,495,679

SLIDE-FASTENER HALF AND METHOD OF MAKING SAME

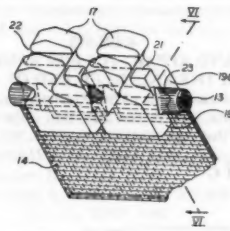
Manuela Scarpini, Milan, Italy, assignor to Interbrev S.A., Luxembourg, Luxembourg

Filed May 28, 1982, Ser. No. 383,127

Claims priority, application Switzerland, May 30, 1981, 3521/81

Int. Cl.³ A44B *19/06*

U.S. Cl. 24—414 **8 Claims**



1. A method of making a slide-fastener half, comprising the steps of:

(a) providing a stringer tape with a carrier cord attached to a longitudinal edge thereof, said carrier cord being of generally circular cross-section with a diameter substantially exceeding the thickness of said stringer tape;

(b) clamping said stringer tape and said carrier cord between jaws of two mold halves defining recesses of generally triangular profile on opposite sides of a plurality of cavities, with closure of said jaws about said carrier cord and resulting deformation of the latter into spaced-apart portions of corresponding generally triangular configuration having bases perpendicular to said stringer tape at said longitudinal edge and vertices pointing away from said stringer tape, the deformation extending into unclamped parts of said carrier cord lying within said cavities; and

(c) molding coupling elements in said cavities with tail sections embracing said unclamped parts and an adjacent

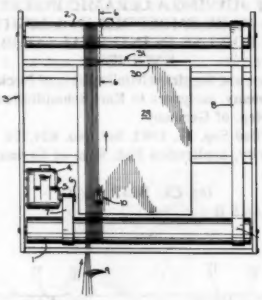
marginal zone of said stringer tape and with heads projecting beyond said carrier cord for interfitting with heads of similar coupling elements of another slide-fastener half, said deformation producing shoulders extending transversely from opposite surfaces of said stringer tape into positive engagement with the coupling elements molded therearound.

4,495,680

METHOD AND APPARATUS FOR FORMING A HELICAL WOUND SUBSTRATE COMPOSED SOLELY OF LONGITUDINAL YARNS

David A. Beck, Appleton, Wis., assignor to Appleton Mills, Appleton, Wis.

Filed Feb. 17, 1982, Ser. No. 349,573
Int. Cl.³ D04H *3/00, 5/02*
U.S. Cl. 28—100 **15 Claims**



13. An apparatus for producing an endless helically wound substrate composed solely of longitudinally extending yarns, comprising a pair of parallel smooth surfaced rolls, drive means to drive at least one of said rolls, a winding member having a leading end and a trailing end, an endless loop disposed around the rolls with one end of said loop connected to the leading end of the winding member and the opposite end of the loop being connected to the trailing end of the winding member, the connections of said loop to said winding member being offset laterally, a plurality of generally parallel yarns connected to the trailing end of the winding member and disposed generally parallel to said loop, spacing means spaced from one of said rolls and having a plurality of spaced guideways to receive and space said yarns, operation of said drive means causing said loop to travel in an endless path around said rolls to wind said yarns in a generally helical pattern on said rolls.

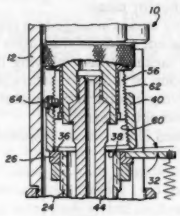
14. A method of forming a helically wound substrate composed solely of longitudinally extending yarns, comprising the steps of mounting a loop around a pair of spaced parallel smooth surfaced guide members, connecting a first end of the loop to a forward end of a winding member at a first connection, connecting a second end of the loop to the rear of the winding member at a second connection spaced laterally from said first connection, connecting the leading ends of a plurality of spaced generally parallel yarns contained on a supply to the rear end of said winding member at a location in general longitudinal alignment with said first connection, moving said winding member forwardly in an endless path of travel around said guide members to draw the yarns from said supply and wind said yarns in helical convolutions about said guide members, and maintaining the wound yarns in spaced parallel relation by passing said wound yarns through said spaced guideways located in spaced relation to said guide members.

4,495,681

DWELL AND DEPTH ATTACHMENT FOR POWER DRILLS

Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 6, 1983, Ser. No. 539,765
Int. Cl.³ B23Q *5/52*; B23B *39/00*
U.S. Cl. 29—26 A **4 Claims**



1. An improved dwell and depth attachment for power drills and the like wherein the drill includes an output shaft that is movable longitudinally and rotatably therein for feeding and rotating drill bits and the like, the improvement comprising:

elongate hollow housing means having a free end and an end connected with the drill;

drive spindle means having one end connected with the output shaft, said spindle means extending through said housing and having a distal end arranged for connection to the drill bit;

an elongate sleeve projecting from the free end of said housing means and encircling said spindle means and having a first end for engaging a work piece that is to be drilled and having a second end;

adjustable depth control means located within said housing means, said control means encircling said spindle means and connected for movement with said spindle means, said control means including a first portion having an end engageable with the second end of said sleeve to limit the movement of said spindle means relative to said sleeve and work piece, said first portion being generally annular, having a threaded interior and having a plurality of circumferentially spaced, radially extending holes therethrough, said control means including a second portion having a threaded exterior mating loosely with the threaded interior of said first portion, whereby said first portion can float relative to said second portion regardless of the relative positions of said portions and having slots substantially equally spaced about said exterior traversing said threaded exterior, said slots forming radially oriented surfaces on said second portion, and also including rotation preventing means located in one of said radially extending holes and only engaging one of the radially oriented surfaces in said second portion, whereby said rotation means does not exert a radially directed force on said first or second portions thereby permitting said first and second portions to float relative to one another when said first portion engages said sleeve means.

4,495,682

APPARATUS FOR MAKING ELECTRICAL HARNESSES

Minoru Matsui, Tsuyamashi, and Yoshihiro Saijyo, Ibaragishi, both of Japan, assignors to Nippon Acchakutanshi Seizo Kabushiki Kaisha, Japan

Filed Jun. 30, 1982, Ser. No. 393,595
Claims priority, application Japan, Jan. 19, 1982, 57-7300
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—33 M **11 Claims**

1. An apparatus for making electrical harnesses that include wires and electrical connector means, the apparatus comprising:

a wire feed path extending substantially horizontally and axially of the apparatus;

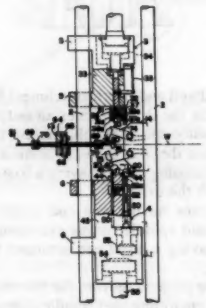
cutter means disposed on opposite sides of the wire feed path for cutting wires fed along the wire feed path into a first and second group of wires having terminal ends adjacent the cutter means;

a first assembly means arranged on respective sides of the wire path adjacent one side of said cutter means for assemblying the terminal end of said first group of wires to electrical connector means;

a second assembly means arranged on respective sides of the wire path adjacent a side of the cutter means opposite the first assembly means for assemblying the terminal ends of the second group of wires to electrical connector means;

means for supplying electrical connector means to said first and second assembly means;

a substantially fixed chuck means disposed adjacent said first



assembly means for equally spaced guiding of the wires to a position adjacent the cutter means;

a further chuck means mounted for movement along said wire feed path for extracting wires from a point adjacent the cutting means for a distance corresponding to a desired length of the electrical harness;

means for actuating said first and second assembly means whereby the terminal ends of the first group of wires and second group of wires are assembled to the electrical connector means by the first and second assembly means in a single assemblying operation; and

guide means arranged along outer sides of said first and second assembly means for guiding the electrical connector means therein, means are provided for selectively raising and lower said guide means, said guide means in a raised position defining a guide wall for guiding the first and second assembly means and, in a lower position, providing access to the first and second assembly means.

4,495,683

ROLLER, IN PARTICULAR TRANSPORT ROLLER

Johannes C. Delhaes, Voerendaal, Netherlands, assignor to Rubber-En Kunststoffabriek Enbi B.V., Voerendaal, Netherlands

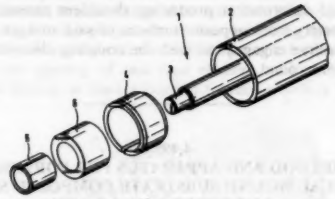
Filed Oct. 8, 1982, Ser. No. 433,373

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140546

Int. Cl.³ B60B *7/00*

U.S. Cl. 29—119 **1 Claim**

1. A transport roller or the like comprising a spindle, a tubular jacket surrounding and concentrically aligned with said spindle, said jacket having an inner circumferential portion, a coupling assembly operatively connecting said spindle and said jacket for conjoint rotation, while permitting limited radial movement between said jacket and spindle, said coupling assembly comprising a clamp-on split ring member seated on said spindle and exerting a radial inward force thereagainst, a clamp-in split ring member engaging said inner circumference portion of said jacket and exerting a radial outward force thereagainst, and an elastomeric annulus interposed between



said split ring members, said annulus being in radial compressed condition.

4,495,684

PROCESS OF JOINING A CERAMIC INSERT WHICH IS ADAPTED TO BE EMBEDDED IN A LIGHT METAL CASTING FOR USE IN INTERNAL COMBUSTION ENGINES

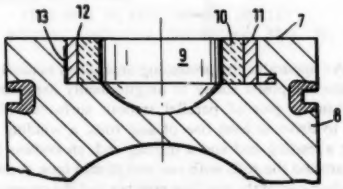
Wilfried Sander, and Siegfried Mielke, both of Neckarsulm, Fed. Rep. of Germany, assignors to Karl Schmidt GmbH, Neckarsulm, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,776

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230388

Int. Cl.³ B23P *15/10*

U.S. Cl. 29—156.5 R **6 Claims**



1. A process of joining an insert of ceramic material having a thermal conductivity below 10 W/mk, a coefficient of expansion below 10×10^{-6}/K and a modulus of elasticity below 7×10^{4} N/mm^2 in the combustion chamber recess of a cast light metal piston, comprising shrinking around the insert a ring of metallic material which resists creep and/or relaxation at temperatures up to at least 300° C. and casting said piston body about said ring and insert assemble.

4,495,685

ROTARY TABLET MACHINE

Jeffrey R. Durik, 199 Ocean Ave., Lakewood, N.J. 08701

Filed Sep. 7, 1982, Ser. No. 415,127

Int. Cl.³ B23P *7/00*

U.S. Cl. 29—402.08 **9 Claims**

1. A method of reclaiming a rotary tablet machine, comprising:

disassembling said rotary tablet machine;

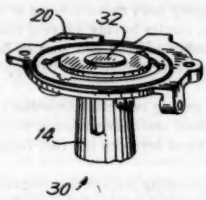
removing a spindle cast integral with a top surface of said machine except for a small raised portion of said spindle;

machining said small raised portion to a predetermined dimension for forming a truncated base;

providing locating means in said truncated base;

fastening a spindle base having corresponding locating means to said truncated base;

inserting a replacement spindle into said spindle base; and



reassembling said rotary tablet machine, whereby said machine will operate as said rotary tablet machine.

4,495,686

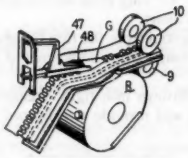
APPARATUS FOR PRODUCING SLIDE FASTENERS FROM CONTINUOUS FASTENER CHAIN

Harry Fisher, Whitestone, and Stuart Fisher, Floral Park, both of N.Y., assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,547

Int. Cl.[3] **B21D** *53/54;* **A41H** *37/06*

U.S. Cl. 29—409 **9 Claims**



1. Apparatus for assembling sliders and bottom stops to the slide fastener stringers of a continuous fastener chain formed with fastener-element-engaged and fastener-element-free gap portions at longitudinally spaced intervals and disposed for successive longitudinal movement through an assembly station comprising sensing means for detecting a gap portion in said chain and stopping movement of said chain, said sensing means including a movable means for extending into said gap portion and transversely spreading said gap portion uncoupling engaged fastener elements, a rotor disposed for rotation in said station beneath said sensing means, said rotor having a slider holding portion and a die plate circumferentially spaced from each other on said rotor, a slider feed means for dispensing a slider for pick-up by said slider holding portion, and a bottom stop assembler means for punching a bottom stop to said chain, such that said rotor rotates to thread said slider carried by said slider holding portion into said gap portion and onto the chain fastener elements and bring said die plate beneath said bottom stop assembler means which punch fixes said bottom stop to said chain at the free end of chain fastener elements closed by said slider.

4,495,687

HOLLOW METAL DOOR MORTISER AND METHOD OF USING SAME

Robert Sieveking, 1211 4th Ave., Rockford, Ill. 61104

Filed Jun. 9, 1982, Ser. No. 386,720

Int. Cl.[3] **B23P** *19/00;* **B21D** *9/05, 31/00*

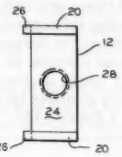
U.S. Cl. 29—426.1 **10 Claims**

1. A mortiser for applying a mortise to the edge of a hollow metal door comprising: a die block adapted to be positioned inside of said door edge at a point adjacent where a mortise is to be formed in said door edge, a cavity in said die block, mortising block means operatively connected to said die block by pressure application means, said mortising block means disposed on the outer side of said door edge adjacent said die block whereby a portion of said door edge extends between said die block and said mortising block, said pressure application means extending between said die block and said mortising block through an aperture in said door edge, said pressure application means including

a threaded bolt mating with a threaded aperture in said die block, said mortising block having an aperture therein, said bolt passing through said aperture in said mortising block whereby said mortising block is freely mounted on said threaded bolt, head means on said bolt extending beyond the aperture in said mortising block whereby rotation of said threaded bolt into said die block causes said head of said threaded bolt to move said mortising block and said portion of said door edges into said cavity in said die block and create an offset in said door edge.

8. The method of applying a rectangular mortise to the edge panel of a hollow metal door having two spaced apart parallel panels adjacent said edge panel, said hollow door comprising an opening therein for location of an entry lockset, an entry lockset mounted in said opening in said hollow metal door, the method comprising the steps of:

forming a first hole in the door edge at the location where said mortise is to be formed;



forming second and third holes in said two spaced apart parallel panels adjacent said first hole;

removing said entry lockset from said door;

inserting a die block having a threaded aperture and a cavity in one face thereof through the opening from which said entry lockset was removed;

positioning said die block in said door behind said first hole whereby said door edge adjacent said first hole is positioned over said cavity in said die block;

inserting pressure application means through said first hole and operably connecting said pressure application means to said die block, said pressure application means including mortising block means extending along the portion of said door edge where said mortise is to be applied, and a threaded bolt extending through said mortising block means and into said threaded aperture of said die block;

applying pressure to said mortising block by means of said pressure application means whereby said mortising block and said portion of said door edge extending along said mortising block are pressed into said cavity of said die block, whereby an offset is formed in said door edge;

removing said threaded bolt from said threaded aperture after formation of said offset in said door edge;

removing said die block from inside said door; and applying a face plate to the offset portion of said door edge.

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PREFABRICATED CONCRETE PANEL WITH TRUSS

Francois Longpré, 6200 Chemin Beaudet; Yves Longpré, Casier Postal 94, rue Léas, and Pierre Longpré, 4974 Chemin Ste-Catherine, all of Rock Forest, Quebec, Canada J0B 2J0

Filed Sep. 7, 1983, Ser. No. 530,105

Int. Cl.[3] **B23P** *19/04;* **E04B** *1/16*

U.S. Cl. 29—460 **13 Claims**

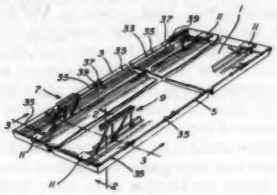
1. Method of manufacturing reinforced concrete flooring tile

by pouring concrete in a mold containing a reinforcement, which comprises:

providing rectangular molds in which at least two opposite sides are flaring up;

pouring concrete in one of said mold while introducing a reinforcement therein, and continuing said pouring until the mold is completely filled with concrete;

separately preparing at least two steel trusses provided with seating pads at both ends thereof, each truss being formed of a base and a rod head, connected together by means of metallic rods arranged in zigzag;



arranging said two trusses spacedly parallel to one another and with the two flaring up sides, disposing said parallel trusses above the surface of freshly poured concrete in said mold, allowing the head to penetrate therein until the seating pads of said trusses are flush with the surface of the concrete, and allowing the concrete in which the head of the trusses are embedded to harden;

removing the reinforced concrete tile from the mold; and

rotating said tile 180° along its longitudinal axis so as to enable it to be readily available for placement on a framework to constitute a flooring tile.

4,495,689

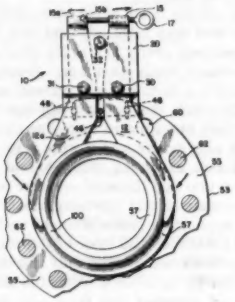
TOOL FOR PLACEMENT OF O-RINGS AND METHOD

Lawrence N. McNeal, 2461 Brahms Blvd., Dayton, Ohio 45449, and Robin A. McNeal, 1301 Levee Dr., Houma, La. 70360

Filed Aug. 24, 1983, Ser. No. 525,851

Int. Cl.³ B23Q *3/00*; B25B *1/20*

U.S. Cl. 29—468 **5 Claims**



1. A tool for positioning an "O" ring in the "O" ring seating groove cut into the face of a section of flanged pipe or the like comprising in combination:

(a) a set of thin, substantially flat tongs whose grasping jaws define the circumference of a circle, the thickness of said grasping jaws being less than the cross-sectional diameter of the annulus of the "O" ring to be grasped by said jaws, each of said tongs having a hole therein,

(b) a pair of parallel facing plates to grasp and hold therebetween the upper ends of said tongs, each of said plates having three or more aligned holes therein,

(c) a plurality of three or more bolts or like fastening means passing through said facing plates, two of said bolts also passing though the tongs and forming pivot points about which said tongs rotate,

(d) means mounted on said bolts to hold the facing plates in fixed parallel relationship,

(e) means for rotating said tongs about their pivot points so that their grasping jaws move toward or away from each other to define circles having varying radii, and

(f) a support member to hold said parallel facing plates and tongs in a fixed vertical plane and to support the tool on a flange.

5. A method for sealing two complementary flanged fittings to provide a leakproof seal therebetween without requiring a worker to place a hand between the two fittings to be joined which comprises:

(a) adjusting the grasping jaws of the tongs of a tool of claim **1** so that the circumference of the circle defined by said jaws is substantially equal to the circumference of the "O" ring seating grooves provided in the said fittings,

(b) inserting into the grasping jaws of the tongs an "O" ring whose annulus has a cross-sectional diameter greater than the thickness of said jaws,

(c) adjusting the position of said tool, if necessary, so that the "O" ring is seated in the seating groove provided in one of said fittings,

(d) attaching said tool onto the flange of said fitting,

(e) moving the second flanged fitting into loose, non-touching engagement with the first flanged fitting, the distance between said flange faces being less than the cross-sectional diameter of the annulus of the "O" ring,

(f) releasing the "O" ring from the tongs by spreading their grasping jaws apart,

(g) detaching the tool from the first flanged fitting and withdrawing the tongs from between the adjoining fittings, and

(h) urging said fittings into tight engagement to compress said "O" ring and provide a leakproof seal between said fittings.

4,495,690

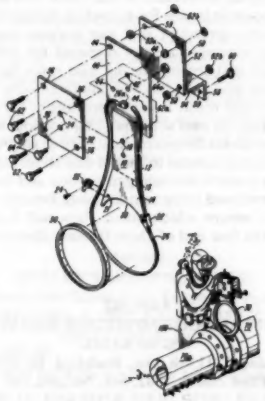
O-RING PLACEMENT TOOL

Lawrence N. McNeal, 2461 Brahms Blvd., Dayton, Ohio 45449

Filed Aug. 24, 1983, Ser. No. 525,852

Int. Cl.³ B23Q *3/00*; B25B *1/20*

U.S. Cl. 29—468 **4 Claims**



1. A tool for positioning an "O" ring in the "O" ring seating groove cut into the face of a section of flanged pipe or the like comprising in combination:

(a) a thin, flat "O" ring positioning plate, the thickness of

said plate being less than the cross-sectional diameter of the annulus of the "O" ring to be positioned by said tool, said plate having;

(i) an upper section of generally rectangular cross-section which has a plurality of holes therein,

(ii) a lower section which;

(a) is integral with said upper section,

(b) has complementary side walls which flare outwardly from the side walls of the upper plate to define a depending skirt,

(c) has a complementary pair of guide members attached to lower sections of the skirt of (a) (ii)

(b) above and which define channels between said guide members and the walls of said skirt, and

(d) has an arcuate lower face adapted to snuggly fit onto an "O" ring to be seated by said tool,

(b) a pair of flat parallel facing plates to grasp and hold therebetween the upper section of said "O" ring positioning plate, said facing plates being wider than the upper section of the "O" ring positioning plate, each of said facing plates having;

(i) a plurality of holes aligned with the holes provided in the upper section of the "O" positioning plate, and

(ii) an additional plurality of aligned holes positioned in the outer sections of said facing plates and beyond the area to be covered by the "O" ring support plate,

(c) a plurality of bolts or like fastening means passing through the holes in said facing plates and said "O" ring positioning plate to hold said plates in fixed parallel relationship,

(d) a length of a flexible "O" ring support band having fastening means on its ends so that the length of the band in the tool can be varied, said band being of a width less than the cross-sectional diameter of said "O" ring and adapted to;

(i) pass through the channels defined by the outer walls of the "O" ring positioning plate, the parallel facing plates and at least one of the bolts of (b) (ii) above,

(ii) pass through the channels defined by the guide members of (a) (ii) (c),

(iii) define a generally circular loop depending from the lower section of the "O" ring positioning plate, and

(e) a support member to hold said facing plates and said "O" ring positioning plate in a fixed plane and to support the tool on a flange.

4. A method for sealing two complementary flanged fittings to provide a leakproof seal therebetween without requiring a worker to place a hand between the two fittings to be joined which comprises:

(a) adjusting the length of the "O" ring support band of a tool of claim 1 so that the circumference of the loop defined by the lower arcuate face of the "O" ring support plate and the "O" ring support band is substantially equal to the circumference of the "O" ring seating grooves provided in said fittings,

(b) inserting into the loop of (a) an "O" ring whose annulus has a cross-sectional diameter greater than the thickness of the "O" ring support plate and width of said band,

(c) adjusting the position of said tool, if necessary, so that the "O" ring is seated in the seating groove provided in one of said fittings,

(d) attachig said tool onto the flange of said fitting,

(e) moving the second flanged fitting into loose, non-touching engagement with the first flanged fitting, the distance between said flange faces being less than the cross-sectional diameter of the annulus of the "O" ring,

(f) unfastening the ends of the "O" ring support band and withdrawing the "O" ring support band from the tool,

(g) detaching the tool from the first flanged fitting and withdrawing the tool from between the adjoining fittings, and

(h) urging said fittings into tight engagement to compress said "O" ring and provide a leakproof seal between said fittings.

4,495,691

PROCESS FOR THE PRODUCTION OF FINE AMORPHOUS METALLIC WIRES

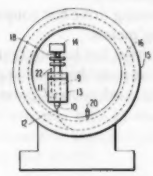
Tsuyoshi Masumoto, No. 8-22, Uesugi 3-chome, Sendai-shi, Miyagi, Japan; Akihisa Inoue, Miyagi, and Michiaki Hagiwara, Kyoto, both of Japan, assignors to Tsuyoshi Masumoto, Miyagi and Unitika Ltd., Amagasaki, both of, Japan

Filed Mar. 29, 1982, Ser. No. 362,791

Claims priority, application Japan, Mar. 31, 1981, 56-48153

Int. Cl.[3] **B22D** *11/12;* **C22C** *30/00*

U.S. Cl. 29—527.5 **3 Claims**



1. A process for producing a fine amorphous metallic wire of substantially circular cross-section comprising the steps of:

(a) selecting an Fe base alloy comprising: from 0.01 to 75 atom% of one or more groups selected from the groups as set forth below, with the remainder being composed substantially of Fe:

(1) 0.01 to 35 atom% of one or more of P, C, Si, B and Ge;

(2) 0.01 to 40 atom% of one or two of Co and Ni;

(3) 0.01 to 15 atom% of one or more of Cr, Nb, Ta, V, Mo, W, Ti, and Zr;

(4) 0.01 to 5.0 atom% of one or more of Mn, Be, Pd, A, Au, Cu, Zn, Cd, Sn, As, Sb, Hf, and Pt;

(b) providing a sufficient quantity of said alloy in a molten state;

(c) jetting said molten alloy, said alloy having an amorphous substance forming ability, through a spinning nozzle into a cooling liquid contained within a rotary member, whereby said liquid causes solidification of said molten alloy thereby producing said fine amorphous metallic wire;

(d) continuously winding upon the inner walls of said rotary member by the action of centrifugal force, the alloy wire thus formed;

(e) removing said alloy wire from said rotary member; and

(f) passing said alloy wire through a die thus drawing said alloy wire within an area reduction percentage range from about 5% to about 90%.

4,495,692

COIL PLACING MACHINE WITH READILY CONVERTIBLE WEDGE MAKING ARRANGEMENT

Robert G. Walker, Ossian, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed Jun. 18, 1982, Ser. No. 389,856

Int. Cl.[3] **H02K** *15/00*

U.S. Cl. 29—564.1 **4 Claims**

1. A device for placing prewound coils and insulating wedges into slots of a dynamoelectric machine stator core member, comprising:

a coil placing apparatus including a cylindrical array of stator-receiving blades and wedge guide members,

a wedge making apparatus connected to said coil placing apparatus, said wedge making apparatus including

(a) a wedge magazine assembly having a cylindrical wedge-receiving magazine coaxial with said coil placing apparatus, said magazine having a toothed ratchet plate,

(b) means for cutting off insulating wedges from an elongated strip of insulating material, and

(c) means for forming the wedges into said magazine for subsequent insertion into the stator core slots,

said cutting means and said forming means being attached to said wedge magazine assembly,

said coil placing apparatus and said wedge making apparatus being a unitary assembly removable as a unit for substitution of differently configured coil placing apparatus and wedge making apparatus,

a drive means for driving said wedge making apparatus, an actuating apparatus for said wedge making apparatus including

(a) a bipartite cut-off drive bar coupling said drive means to said cutting means,

(b) a bipartite forming drive bar coupling said drive means to said forming means,

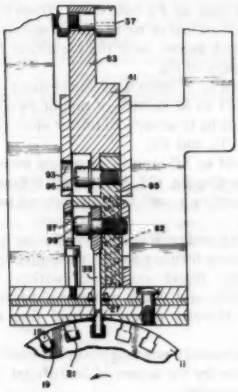
each said bipartite drive bar having first and second separable parts, said first parts being operatively connected to said drive means, said second parts being respectively operatively connected to said cutting means and said forming means, said second parts of both said drive bars forming parts of said wedge making apparatus,

means for releasably connecting said first parts to respective said second parts comprising clamp means at one end of one part and a clamp receiving means at one end of the other bipartite part, and

a bipartite actuating arm for indexing said wedge-receiving magazine, said bipartite actuating arm including

(a) a first segment operatively connected to said drive means, and

(b) a second segment having a spring loaded pawl for engaging and pushing said ratchet plate to thereby index said wedge-receiving magazine, said first segment and said second segment being in abutting engagement only with each other, said second segment forming a part of said wedge making apparatus whereby said pawl and said ratchet plate are removable with said coil placing apparatus and said wedge making apparatus.



4,495,693

METHOD OF INTEGRATING MOS DEVICES OF DOUBLE AND SINGLE GATE STRUCTURE

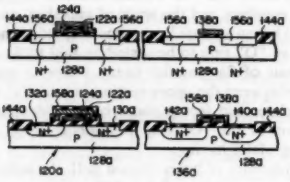
Hiroshi Iwahashi, Yokohama; Masamichi Asano; Kuniyoshi Yoskikawa, both of Tokyo, and Masazi Mito, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 273,245, Jun. 12, 1981,. This application Apr. 22, 1983, Ser. No. 487,765

Claims priority, application Japan, Jun. 17, 1980, 55-81724

Int. Cl.³ G11C *11/40;* B01J *17/00;* H01L *29/27*

U.S. Cl. 29—571 9 Claims



1. In a method for manufacturing a nonvolatile semiconductor memory device a method of forming an MOS device of double gate structure comprising the steps of:

forming a first electroconductive layer which is superposed on a semiconductor substrate with a first insulating film interposed therebetween;

forming a second electoconductive layer which is superposed on said first electroconductive layer with a second insulating film interposed therebetween;

forming a control gate by selectively etching said second electroconductive layer;

forming a floating gate by selectively etching said first electroconductive layer with said control gate as a mask, said floating gate being formed to have a length as viewed in a channel direction shorter than that of said control gate in the same direction; and

introducing impurities by ion implantation into said semiconductor substrate with said control gate as a mask to form source and drain regions; and thermally processing said source and drain regions to extend these regions into those portions of said semiconductor substrate being under the end portions of said floating gate.

4,495,694

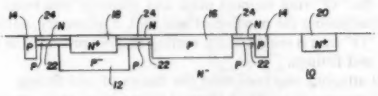
METHOD OF FABRICATING AN ISOLATED GATE JFET

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 309,194, Oct. 6, 1981, Pat. No. 4,456,918. This application Apr. 13, 1984, Ser. No. 599,817

Int. Cl.³ H01L *29/80, 27/02, 27/04*

U.S. Cl. 29—571 6 Claims



1. A method of fabricating a thin channel junction field effect transistor comprising:

diffusing impurities into a bottom gate region of a first conductivity type to form an isolation region of a second conductivity type opposite said first impurity type;

diffusing impurities into said bottom gate region to form spaced source and drain regions of said second conductivity type;

diffusing impurities into said isolation region to form a top

gate contact region of said first conductivity type isolated from said bottom gate region by said isolation region;

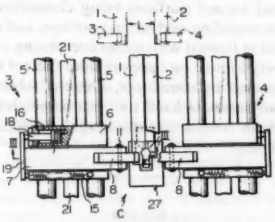
ion implanting impurities into said bottom gate region and said isolation region to form a channel isolation region of said second conductivity type and a top gate region of said first conductivity type covering said channel isolation region and contacting said top gate contact region.

4,495,695

APPARATUS FOR MANUFACTURING SLIDE FASTENER HAVING SEPARABLE END STOP

Mitsugu Umino, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,644
Claims priority, application Japan, Jul. 10, 1982, 57-120179
Int. Cl.³ A41H *37/06*; B21D *53/50*
U.S. Cl. 29—767 **3 Claims**



1. An apparatus for manufacturing a slide fastener having a separable end stop through the steps of attaching a pin, box pin, slider and box to a pair of stringers while the stringers are being fed in a parallel state by grippers, said stringers having a space portion devoid of fastener elements and upper stoppers affixed adjacent to the space portion, characterized in that said apparatus comprises a pin fitting attaching unit for attaching the pin and box pin to the core portions of the stringers, a slider attaching unit, and a box attaching unit for attaching the box to the box pin, said pair of stringers being fed so as to pass through said pin attaching unit, said slider attaching unit and said box attaching unit, said slider attaching unit having a transfer holder for carrying the slider into the path of travel of the stringers from a slider supply device, and a retaining device for retaining the slider between itself and said holder, said retaining device including a stopper block having a portion for embracing the slider between itself and the transfer holder, and a shoulder portion for impeding movement of the slider in the travelling direction of the stringers, as well as an engaging block having a portion for embracing the slider between itself and the transfer holder, these two blocks being driven so as to assume positions where both blocks cooperate with the transfer holder to retain the slider when the stringers are passed through the slider, after which the stopper block is driven so as to separate from the slider, whereby the slider is freed from between the transfer holder and engaging block automatically when the upper stoppers of said stringers engage the slider.

4,495,696

SCISSORS SHEATH HAVING INTEGRAL BLADE SHARPENER

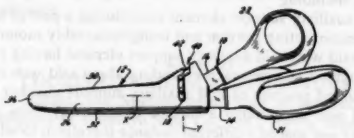
Wayne G. Fethke, Wausau, and Daniel D. Call, Athens, both of Wis., assignors to Oy Fiskars AB, Helsinki, Finland

Filed Dec. 29, 1982, Ser. No. 454,465
Int. Cl.³ B26B *13/00*; B24D *7/16*
U.S. Cl. 30—138 **7 Claims**

1. In combination:

a scissors sheath including an elongated passage open at one end for accommodating insertion and withdrawal along a path of travel in said passage of the closed blades of a pair of scissors;

blade sharpening means on said sheath comprising a sharpening slot extending from a side of said sheath transversely into said passage for receiving the scissor blades, said blade sharpening means further comprising a blade sharpening element mounted on said sheath within said slot intermediately of outer and inner slot portions of said slot; and



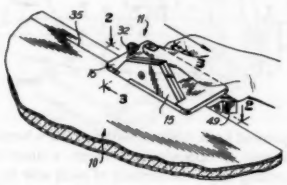
latch means for releaseably securing said pair of scissors in said sheath comprising a resiliently flexible member integrally formed on said sheath within said passage and normally biased into said path of travel but displaceable therefrom for releaseable engagement with a pair of scissors inserted into said sheath.

4,495,697

PLASTERBOARD TRIMMING TOOL

Stanley Ruff, 9 Arbor Dr., New Rochelle, N.Y. 10804

Filed Aug. 31, 1982, Ser. No. 413,267
Int. Cl.³ B26B *29/00*
U.S. Cl. 30—294 **15 Claims**



1. A plasterboard trimming tool, comprising:

(a) a support including

(i) at least two arms and

(ii) an interconnecting portion connecting said arms and keeping the same apart, said interconnecting portion including a web rigid with said arms and constituting a main support element therewith;

(b) means for guiding said support on a marginal portion of the plasterboard in a position in which said support embraces the marginal portion, including

(i) lateral guiding surfaces on said arms facing one another and spaced from each other by a distance substantially equal to the thickness of the plasterboard to engage the major surfaces of the latter in said position, and

(ii) a transverse guiding surface extending between said lateral guiding surfaces substantially normal thereto on said interconnecting portion to engage the edge face of the plasterboard in said position;

(c) means for simultaneously scoring the plasterboard at both of the major surfaces thereof in continuous straight cuts parallel to and spaced a predetermined distance from the edge surface of the plasterboard during the movement of said support in said position along the marginal portion of the plasterboard, including

(i) at least a pair of cutting blades each having at least one cutting edge, and

(ii) at least a pair of holders each arranged on one of said arms of said support and operative for holding the associated cutting blade in at least one cutting position relative to the respective arm in which said cutting blade projects beyond the associated lateral guiding

surface into the space between said lateral guiding surfaces at said predetermined distance from said transverse guiding surface, and said cutting edge thereof faces in the direction of movement of said support along the marginal portion of the plasterboard; and

(d) means for selectively changing said predetermined distance, including

(i) an auxiliary support element constituting a part of said interconnecting portion and being removably mounted on said web, said auxiliary support element having two elongated sections each extending along said web in a mounted position of said auxiliary support member on said web and having a surface facing away from the latter and spaced a different distance therefrom to selectively serve as said transverse guiding surface when the respective section is received in the space between said arms and thus to change said predetermined distance on reversal of the position of said auxiliary support element.

4,495,698

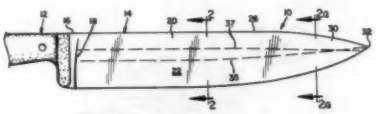
CONCAVE GRIND KNIFE BLADE AND METHOD OF MAKING

Joseph R. Gerber, Jr., Lake Oswego, Oreg., assignor to Gerber Legendary Blades, Portland, Oreg.

Filed Sep. 1, 1982, Ser. No. 413,666

Int. Cl.³ B26B *3/03*; B21K *11/02*

U.S. Cl. 30—357 **8 Claims**



1. An improved knife blade configuration wherein the blade comprises a pair of opposite side faces, a blunt edge and a sharpened cutting edge, the surface of each side face from said blunt edge to said sharpened cutting edge in a longitudinal mid-portion of the blade being slightly concave about a large, single radius of constant curvature, the blade having a median thickness substantially nearer the blunt edge than the cutting edge over a substantial portion of the length of the blade, the side faces being substantially parallel immediately above the sharpened cutting edge.

4,495,699

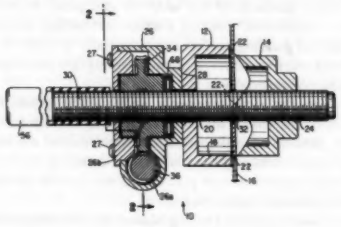
HOLE PUNCH APPARATUS

Harry C. Oakes, 3771 Club Rd., Perry, N.Y. 14530

Filed Sep. 30, 1982, Ser. No. 431,286

Int. Cl.³ B26F *1/00*; B23B *5/00*

U.S. Cl. 30—360 **5 Claims**



1. Hole punch apparatus comprising:

first and second cooperating dies respectively mountable on opposite sides of a workpiece, said first die and workpiece each being formed with an aperture therein,

a housing engageable with said first die,

a shaft supported within said housing, insertable through said apertures, and engageable with said second die,

a worm wheel threaded on said shaft,

a worm engageable with said worm wheel,

drive means including a power drill and means coupling said drill and said worm, whereby, when said drive means is actuated, said second die is drawn against said workpiece, compressing said workpiece between said first and second dies, and said first and second dies cooperate to punch a hole in said workpiece,

said coupling means comprising a first portion rotatable by said drill, a second portion rotatable with said worm, and shearable means cooperating with said first and second portions for normally constraining them to rotate together but shearing in case of overload to permit said first portion to be rotated by said drill while said second portion remains stationary, and

said first and second portions being concentric, said first portion surrounding said second portion, and said second portion being formed with means comprising a pair of flats respectively formed on opposite sides thereof for facilitating engagement by a hand tool, whereby, when said shearable means shears, a hand tool can be employed to turn said worm in reverse and disengage said apparatus from said workpiece.

4,495,700

APPARATUS FOR MEASURING THE ANGULAR DISPLACEMENT OF TWO OBJECTS RELATIVE TO EACH OTHER

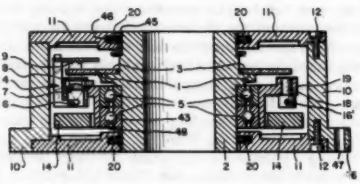
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,332

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206875; Jan. 15, 1983, 3301205

Int. Cl.³ G01B *11/26*

U.S. Cl. 33—1 N **23 Claims**



1. In an apparatus for measuring the angular position of a first and second object rotatable relative to one another of the type in which a graduated plate is attached to a rotatable shaft, and the angular displacement of the graduated plate is measured by a scanning unit, the improvement comprising:

means for rigidly securing said rotatable shaft and graduated plate to the first object;

a housing enclosing said graduated plate and scanning unit;

means for rigidly securing said housing to the second object;

means disposed within the housing for supporting said scanning unit on said rotatable shaft; and

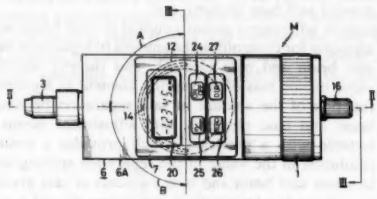
coupling means disposed within the housing for securing said scanning unit to said housing to prevent said scanning unit from twisting with respect to said housing;

said housing cooperating with the second object to protect the graduated plate, the scanning unit, the shaft, and the coupling means from external forces by conducting external forces to the second object.

4,495,701
DIGITAL INDICATION TYPE MICROMETERHEAD

Tetsuya Nakadoi, Hiroshima, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,337
Claims priority, application Japan, Mar. 31, 1982, 57-46364[U]
Int. Cl.³ G01B 3/18, 7/02
U.S. Cl. 33—166 16 Claims

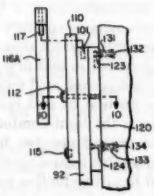


1. A digital indication type micrometer head comprising: a spindle made displaceable in the axial direction thereof by rotation of a thimble through a screw feed mechanism; a displacement detector for detecting displacement values of said spindle; and operational means for processing detection signals emitted from said displacement detector and calculating a digital indication value; and a digital indicator secured rotatably to a surface of a casing for indicating the result of calculation of said operational means so that said digital indicator can take a normal position with a portion thereof at the side of the forward end of the spindle being disposed upwardly and a position or positions rotated through substantially 90° from said normal position.

4,495,702
CHILD'S GROWTH MEASURING AND REGISTERING DEVICES

Lowell C. Bergstedt, 47 Dartmouth St., San Francisco, Calif. 94134

Filed Aug. 25, 1982, Ser. No. 411,431
Int. Cl.³ G01B 3/00
U.S. Cl. 33—169 R 7 Claims

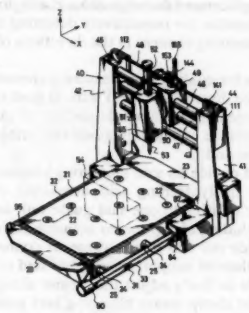


1. In a growth measuring and indicating unit for children, an elongated stick and a height marking means adapted to be removably mounted to said elongated stick and including a flat stick-abutting surface, and a flat gaging surface extending transverse to said stick-abutting surface and adapted to contact the head of a child standing next to said stick and thereby to indicate the height of said child on said stick, said elongated stick comprising a plurality of separate stick sections and means for releasably fastening said stick sections together in end-to-end butting relationship including aligning means cooperatively engaging adjacent stick sections to maintain vertical alignment therebetween, said unit further comprising stand means adapted to rest on the floor of a room and means for releasably securing said stick to said stand means, including aligning means for maintaining said stick in a vertical upright orientation on said stand means, said height marking means comprising a generally flat, paddle shaped board having a threaded means in one broad surface thereof, said stick having an aperture through a top section thereof, and said unit further comprises a threaded fastener adapted to extend through said aperture in said stick and to thread into said threaded means in said height marking means to mount said height marking means to said stick.

4,495,703
COORDINATE MEASURING INSTRUMENT

Hideo Sakata, and Masami Saito, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1982, Ser. No. 441,149
Claims priority, application Japan, Nov. 25, 1981, 56-188926; Nov. 25, 1981, 56-188927; Nov. 25, 1981, 56-188928; Nov. 25, 1981, 56-188929; Nov. 25, 1981, 56-188930; Nov. 25, 1981, 56-188931; Nov. 25, 1981, 56-188932; Nov. 25, 1981, 56-188933; Nov. 25, 1981, 56-188934; Nov. 25, 1981, 56-188935; Nov. 25, 1981, 56-175011[U]
Int. Cl.³ G01B 7/03
U.S. Cl. 33—174 L 18 Claims



1. A coordinate measuring instrument comprising:
a bedplate for mounting thereon a workpiece to be measured, directions with respect to said bedplate being definable by mutually intersecting X and Y and Z axes fixedly oriented with respect to said bedplate;
a pair of guide rails located to flank opposite sides of said bedplate, which sides extend in:the direction of the Y axis, said guide rails each having means inserted into and supported by openings provided in opposite side surfaces of said bedplate and by which said guide rails are aligned in the direction of the Y axis, the upper surface of at least one said guide rail being parallel to the upper surface of said bedplate;
a measuring element support member including a pair of supports guided along said guide rails, a slider guide rail racked across the upper end portions of said supports, a slider slidable along said slider guide rail in the direction of the X axis, and a spindle movably supported in said slider in the direction of the Z axis;
a measuring element mounted on one end of said spindle; and
detectors for detecting displacement values of said measuring element in the directions of the X, Y and Z axes.

7. A coordinate measuring instrument comprising:
a bedplate;
a measuring element;
a measuring element support member for supporting said measuring element for displacement with respect to the upper surface of said bedplate along mutually perpendicularly intersecting X, Y and Z axes;
an X axis direction displacement detector, a Y axis direction displacement detector and a Z axis direction displacement detector for respectively detecting displacements of said

measuring element in the directions of the X, Y and Z axes;

guide rails for guiding said measuring element support member in the direction of the Y axis, at least one of said guide rails projecting from a side surface of said bedplate and the upper surface of said one guide rail being in parallel to the upper surface of said bedplate said measuring element support member including a pair of supports, two slider guide rails parallel to each other and racked across said supports, a slider slidable along said slider guide rails in the direction of the X axis, and a measuring element supported by said slider in a manner to be movable in the direction of the Z axis; and adjusting means for making said measuring element displaceable in the direction of the X, Y and Z axes at connecting portions between the slider guide rails and at least one of said pair of supports.

17. A coordinate measuring instrument comprising:

a bedplate;

a measuring element;

a measuring element support member for supporting said measuring element for displacement with respect to the upper surface of said bedplate along mutually perpendicularly intersecting X, Y and Z axes;

an X axis direction displacement detector, and Y axis direction displacement detector and a Z axis direction displacement detector for respectively detecting displacements of said measuring element in the directions of the X, Y and Z axes;

guide rails for guiding said measuring element support member in the direction of the Y axis, at least one of said guide rails projecting from a side surface of said bedplate, the upper surface of said one guide rail being parallel to said bedplate; and

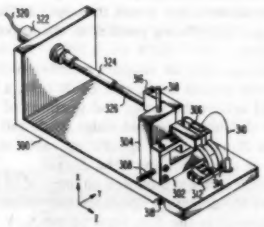
a fine feed device on said measuring element support member for finely feeding said measuring element support member relative to one said guide rail, said fine feed device including clamp means actuable to releasably clamp said guide rail and fine feed means connecting said measuring element support member to said clamp means and rotatable to finely adjust the former along said guide rail with said clamp means clamping said guide rail.

4,495,704

MICROTRANSLATOR AND MICROTRANSLATOR ASSEMBLY

Jacob M. Hammer, Princeton, N.J., and Clyde C. Neil, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,737
Int. Cl.³ G01B 5/00
U.S. Cl. 33—180 R **6 Claims**



1. A microtranslator for holding a device and translating said device, with a positioning resolution of the order of 200 nanometers or less, in a direction substantially parallel to a given spatial axis; said microtranslator comprising:

a stationary rigid base element having a longitudinal dimension perpendicular to said given axis;

a rigid beam element situated in cooperative spatial relationship with said base element with a longitudinal dimension of said beam element being oriented substantially parallel to the longitudinal dimension of said base element, said beam element supporting a holder for said device which is located at a given position along the longitudinal dimension of said beam element;

a spring element coupling said beam element to said base element to permit limited movement over a range of said beam element with respect to said base element, said movement being in a direction essentially parallel to said given axis, with said spring element being biased so as to urge said beam element in a direction of movement toward said base element; and

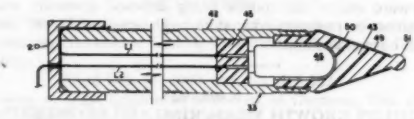
precision adjustment means coupled to said beam and base elements for controlling the amount of separation between said beam and base elements and thereby varying the value of said bias of said spring element as a given linear function of the amount of said separation between said beam and base elements, said adjustment means being settable with a precision which provides a positioning resolution in the value of the separation spacing distance between said beam and base elements at said given position along the longitudinal dimension of said beam element of the order of 200 nanometers or less.

4,495,705

ILLUMINATED SIGHT FOR AIMING A BOW

Robert J. Kowalski, 540 Old Plank Rd., Rte. 8, Butler, Pa. 16001, and William C. Wilmoth, 233 Cameron Dr., Mars, Pa. 16046

Filed May 16, 1983, Ser. No. 495,137
Int. Cl.³ F41G 1/46, 1/34
U.S. Cl. 33—265 **9 Claims**



1. A device for use in aiming a bow, said device comprising, in combination, first and second members having between them a releasable interlocking connection, said second member having a light-conductive pathway communicating with an end portion of said first member at said releasable interlocking connection, said first member having an internal cavity extending to the sight of said connection, a light bulb socket supported in said internal cavity in said first member for access by disengaging said releasable interlocking connection, an incandescent light bulb accessible in said first member while operatively engaged with said socket, said second member having a cavity to received a portion of said bulb such that the bulb confronts and irradiates the light-conductive pathway of said second member, said second member having a reduced size body position extending to a light-dispersing end portion communicating with said light-conductive pathway, power means including a switch coupled by an electrical conductor in said first member for energizing said incandescent light bulb, and holder means adapted to be secured to the bow above an arrow-receiving portion thereof for supporting said first and second cylindrical members such that said light-dispersing end portion can extend in a line-of-sight with a target.

4,495,706

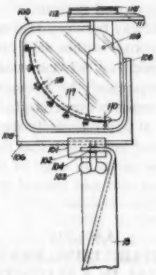
ALIGNMENT GAGE FOR DISH ANTENNA

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Jul. 19, 1982, Ser. No. 399,307
Int. Cl.³ G01C 17/18, 23/00
U.S. Cl. 33—333 **9 Claims**

1. In a receiving antenna structure having a dish antenna fixed in a predetermined position, the improvement in combi-

nation therewith comprising an alignment gage for establishing the correct azimuthal and elevational orientation of the pointing axis comprising the electrical boresight of the antenna including means for visually measuring the azimuthal position of the pointing axis including means for measuring the angular deviation in the horizontal plane from magnetic north, said azimuthal measuring means comprising a magnetic compass having a rotatably mounted partially magnetized movable indicator and a graduated angular scale surrounding said indicator; means for visually measuring the elevational position of the pointing axis including means for measuring angular deviation in the vertical plane from a true vertical axis, said elevational position measuring means comprising a graduated angular scale generally vertically disposed when the gage is



mounted on the antenna, a pivotally mounted vertically hanging weighted pendulum having indicating means on one end thereof cooperating with said scale to display the vertical angular deviation, a plate like mounting bracket, means for pivotally mounting said pendulum to said bracket, said scale comprising a plurality of equally spaced indicia spaced equal distances from the pivot point on one surface of the bracket, and means for mounting said compass to said pendulum such that said movable indicator remains substantially horizontal with changes in inclination of the antenna; and means for temporarily and detachably mounting said gage to the antenna so that said azimuthal and elevational measuring means are readily visible to permit easy adjustment of the pointing axis to a predetermined desired position.

4,495,707

BIDIRECTIONAL PLUMB BOB LEVEL

James R. Rousey, Rte. 1, Box 193J, Eatonville, Wash. 98328

Filed Feb. 16, 1984, Ser. No. 580,661

Int. Cl.[3] **G01C** *15/10*

U.S. Cl. 33—392 **33 Claims**

1. A plumb bob level comprising:

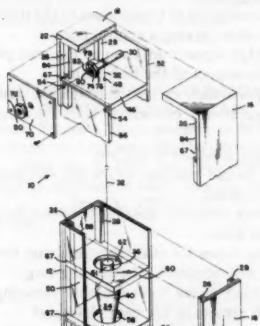
a rigid metallic casing having two parallel, spaced-apart, opposed elongated sidewalls, each of said sidewalls having a planar exterior surface parallel with said exterior surface of the opposing sidewall, said sidewalls being rigidly connected together by an upper end wall and a lower end wall positioned at the longitudinal ends of said sidewalls, said end walls each having a planar exterior surface oriented perpendicular to both of said sidewall exterior surfaces, said sidewalls and end walls each having two opposed, parallel, planar exterior edge surfaces oriented perpendicular to said sidewall and end wall exterior surfaces and defining outwardly facing, planar front and rear surfaces, each of said sidewalls having a pair of spaced-apart, longitudinally extending, interior flanges recessed inward from said sidewall exterior edge surfaces;

a shaft positioned and rotatably supported toward said upper end wall and having a flexible line attached thereto and extending longitudinally within said casing toward said lower end wall, said shaft being selectively rotatable for adjusting the length of said line extending from said shaft;

an elongated plumb bob with longitudinal upper and lower end portions and an enlarged midportion therebetween, said upper end portion being secured to said line toward said lower end wall for suspension from said shaft and positioning of a pointed tip of said lower end portion in proximity and alignment with a cross-hair-type target formed on an interior surface of said lower end wall, said plumb bob being free-swinging for movement in all directions responsive to the angular orientation of said casing with respect to true vertical;

a guide plate positioned toward said upper end wall below said shaft and extending between said sidewalls for maintaining the spacing therebetween, said guide plate having an aperture laterally aligned with said target and having said line extending through said aperture to maintain said line laterally centered within said casing relative to said target, regardless of the position of said line on said shaft, said aperture being sized large enough to permit free passage of said line therethrough but small enough to substantially limit lateral movement of said line therein;

transparent front and rear face plates attached to said casing in position against said flanges, with an outward surface of



said face plates being positioned at or inward of said respective front and rear casing surfaces, said face plates extending between said sidewalls and at least partially enclosing said casing while permitting substantially uninhibited viewing of the plumb bob, shaft, line and target;

a transparent first gusset plate positioned toward said lower end wall and intermediate said plumb bob upper and lower end portions, said first gusset plate extending between said sidewalls for maintaining the spacing therebetween and having an aperture with said plumb bob positioned therein, said aperture being sized large enough to permit free-swinging of said plumb bob during normal usage but small enough to prevent said plumb bob from swinging into contact with said sidewalls or face plates; and

a transparent second gusset plate positioned intermediate said first gusset plate and said plumb bob upper end portion, above said plumb bob midportion, said second gusset plate extending between said sidewalls for maintaining the spacing therebetween and having an aperture with said plumb bob positioned therein, said aperture being sized large enough to permit free-swinging of said plumb bob during normal usage but small enough to prevent said plumb bob midportion from passing therethrough when the level is inverted.

4,495,708

DRAWING HEAD FOR A DRAWING MACHINE

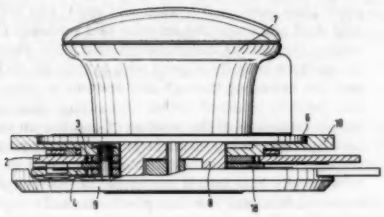
Uwe Jopt, Wilhelmshaven, and Hans Eder, Schortens, both of Fed. Rep. of Germany, assignors to Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. KG, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 23, 1983, Ser. No. 468,969

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206550

Int. Cl.³ B43L 13/02

U.S. Cl. 33—438 21 Claims



1. A drawing head:

a base plate adapted to be attached to the drawing machine, the base plate having a central bore;

a straightedge support adjacent to the base plate and rotatable with respect to the base plate;

a central pin which extends through the central bore and being operatively connected with the straightedge support;

a cover plate attached to the pin;

a gripping handle attached to the pin and projecting above the cover plate;

a spacing ring rotatably mounted between the base plate and the cover plate;

first locking means for releasably retaining the straightedge support with respect to the spacing ring;

second locking means for releasably retaining the spacing ring with respect to the base plate; and

bearing means which are rotatably surrounding the central pin and which are rotatably mounted in the bore of the base plate and which are rotatable with the spacing ring, the straightedge support being axially supported and rotatably positioned on the bearing means.

4,495,709

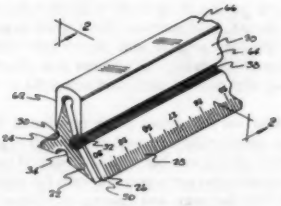
SNAP-ON ADAPTOR FOR ARCHITECT'S SCALE

Joseph S. Mainenti, 16 Lilro Ct., Wayne, N.J. 07470

Filed Nov. 5, 1982, Ser. No. 439,338

Int. Cl.³ G01B 3/04; B43L 7/00

U.S. Cl. 33—484 9 Claims



1. An adapter to a triangular ruler having three sides and a central groove along each of said sides, said adapter comprising:

two parallel outer edges of nearly the same or a slightly shorter length than the length of said ruler;

an inner contour surface extending inward from one of said outer edges and terminating at the second edge;

an outer surface extending outward from one of said edges and terminating at the second edge;

two elongated beads on said inner contour surface, each of said beads being adaptable to be snapped into one of said central grooves so as to hold said adapter firmly against ruler;

outer indentures on said outer surface opposite and parallel to each of said beads;

a flap between each of said edges and each of said outer indentures on the outer surface, the inner surface of each of said flaps extending from one of said edges to one of said beads;

a substantially smooth and substantially flat portion on said outer surface midway between said outer indentures; and

a circular inner groove within said inner contour surface parallel to and midway between said beads and directly opposite said flat portion, the distance between said inner groove and said beads being separated by substantially flat sections tapered at approximately the same angles of said triangular ruler and being such that the deepest portion of said inner groove abuts an edge of said ruler when said beads are snapped into said central grooves.

4,495,710

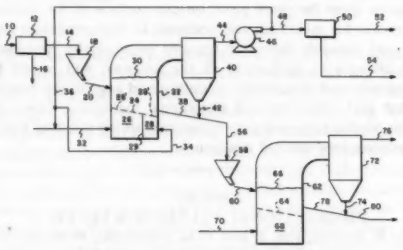
METHOD FOR STABILIZING PARTICULATE LOW RANK COAL IN A FLUIDIZED BED

Javan D. Ottoson, Anchorage, Ak., assignor to Atlantic Richfield Company, Los Angles, Calif.

Filed Aug. 1, 1983, Ser. No. 519,177

Int. Cl.³ F26B 3/08; C10L 5/00; F27B 15/00

U.S. Cl. 34—10 10 Claims



1. In a method for drying particulate low rank coal in a fluidized bed, said method consisting essentially of:

(a) charging said coal to a coal drying zone;

(b) supporting said coal above a support means in said coal drying zone, said support means being adapted to the flow of a hot fluidizing gas upwardly through said support means and said coal;

(c) flowing hot fluidizing gas through said support means and said coal to fluidize said coal and dry said coal; and,

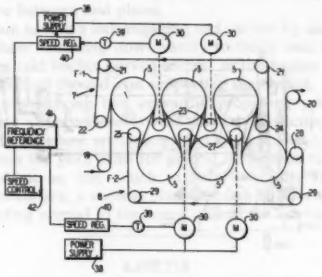
(d) retaining said coal in said drying zone for a time sufficient to reduce the water content of said coal to a desired level;

an improvement comprising, fluidizing said coal above a first portion of said support means with a hot fluidizing gas at a temperature from about 400° to about 900° F. to dry said coal and fluidizing said coal above a second portion of said support means with a recycle gas stream, from said coal drying zone and at a temperature below about 200° F. to stabilize the temperature of of said coal, said second portion of said support means being adjacent the coal discharge from said coal drying zone.

4,495,711
DRYER SECTION DRIVE ARRANGEMENT FOR PAPER MAKING MACHINES

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 392,720, Jun. 28, 1982, now Defensive Publication No.
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—23 **14 Claims**



1. In a paper making machine dryer section of the type having a plurality of rotatably mounted heated dryer rolls arranged in cooperative upper and lower tiers and each having a peripheral drum surface over which a paper web to be dried is adapted to be run in a sinuous path successively around the dryer rolls of the tiers, and respective dryer felts for guiding and holding the web onto the dryer roll peripheral drum surfaces in each tier, said felts also functioning to maintain substantial drum surface running speed synchronism of the rolls in the respective tier with which each felt is associated, the improvement comprising:

each of said dryer felts being trained over guide rollers exclusively for that felt and maintained under roll driving tension against said dryer roll drum surfaces;

a plurality of electrical felt driving motors operatively coupled respectively to the guide rollers of the upper tier felt;

a plurality of electrical felt driving motors drivingly coupled respectively to the guide rollers of the lower tier felt; and,

means for synchronizing only one of said motors for each felt with only one said motors for the other felt for synchronizing the running speed of said dryer felts and thereby synchronizing the running speed of said roll tiers, and comprising a frequency reference device connected to respective speed regulators for each of said one motors, a tachometer connected between each of the speed regulators and each of said one motors, a speed control connected to said frequency reference device, and a power supply for all of said motors.

4,495,712
PAPER MAKING MACHINE DRYER SECTION DRIVE

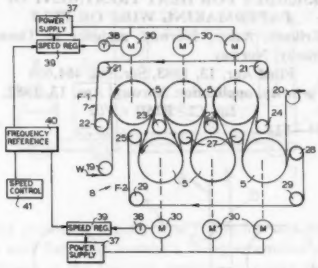
Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 28, 1982, Ser. No. 392,720
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—52 **11 Claims**

1. In a paper making machine dryer section of the type having a plurality of rotatably mounted heated dryer rolls arranged in cooperative upper and lower tiers each having a drum surface over which a paper web to be dried is adapted to be run in a sinuous path successively around the dryer rolls of the tiers, and respective dryer felts for guiding and holding the web onto the dryer roll peripheral surfaces in each tier, said felts also functioning to maintain substantial drum surface running speed synchronism of the rolls in the respective tier with which each felt is associated, the improvement comprising:

each tier of rolls having a plurality of electrical driving motors for driving exclusively the rolls in that tier;

means for effecting a driving coupling for the motors in each tier with the respective dryer rolls in that tier;

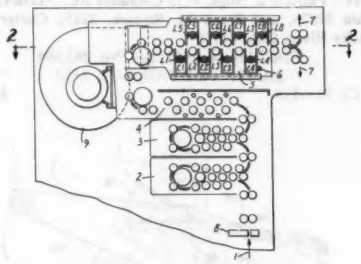


and means for synchronizing only one of the motors of each tier with only one of the motors of the other tier for synchronizing the drum surface running speed of each roll tier with respect to the other roll tier.

4,495,713
INFRARED DRYING FOR WATER-IMPREGNATED PHOTOGRAPHIC FILMS

Mario Williner, Ferrania, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 4, 1982, Ser. No. 385,048
Claims priority, application Italy, Jun. 19, 1981, 48720 A/81
Int. Cl.³ F26B *23/04*
U.S. Cl. 34—68 **9 Claims**



1. An apparatus for drying a photographic film impregnated with water, which comprises a drying chamber provided with an inlet and an outlet, conveying means at least partially placed inside said chamber, infrared radiation sources of elongated shape turned towards the film conveying plane and means for the circulation of air at the actual working temperature inside said drying chamber, characterized in that said apparatus includes:

(a) means to measure the temperature of the air circulating inside the drying chamber;

(b) means to vary the electric power applied to the infrared ray sources;

(c) means which, dependent upon the result of said measurement of the air temperature, increase or decrease said applied power if the temperature is respectively found to be lower or higher than a predetermined value,

the lamp power decrease variation, in the presence of a film to be dried, being unable to reach a value lower than a given minimum power threshold which, combined with the air at the

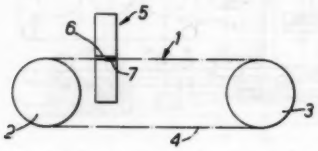
actual working temperature, is capable of providing for the drying of the film.

4,495,714

ASSEMBLY FOR HEAT TREATMENT OF A PAPERMAKING WIRE OR FELT

Günnar Eriksen, Asker, Norway, assignor to Thune-Eureka A/S, Tranby, Norway

Filed Apr. 13, 1983, Ser. No. 484,609
Claims priority, application Norway, Apr. 13, 1982, 821205
Int. Cl.³ F26B *13/02*
U.S. Cl. 34—111 **7 Claims**



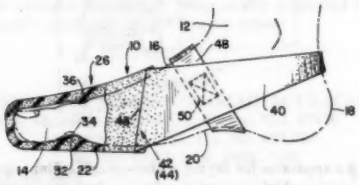
1. An assembly for heat treatment of travelling papermaking wire or felt, comprising mutually opposing heating surfaces, which are stationary when the travelling wire or felt moves between them but which may be moved together toward the felt/wire said heating surfaces being alternately offset with respect to the opposing heating surface toward and away from the felt/wire in the direction of travel of the felt/wire.

4,495,715

FOOT APPLIANCE

James C. Fredrickson, 629 Tollis Pkwy., Broadview Hts., Ohio 44147; Patricia J. Noga, 4775 Columbia Rd., North Olmsted, Ohio 44070, and Frank M. Strasek, 21851 Center Ridge, Rocky River, Ohio 44116

Filed May 14, 1981, Ser. No. 263,694
Int. Cl.³ A43B *3/00, 3/18, 3/20*
U.S. Cl. 36—113 **3 Claims**



1. A foot appliance for use in the martial arts comprising in combination:

a generally cup-shaped member of soft flexible material adapted to be closely placed over the toes of the foot, said member covering the toes of the foot for providing support therefor and having portions in contact with the foot extending toward the foot ball and instep areas;

ridges disposed on the interior surface of said cup-shaped member, one of said ridges adapted to engage the underside of the foot and another of said ridges adapted to engage the upper surface of the foot, the engagement of said ridges occurring at generally the areas of interconnection of the toes with the foot; and,

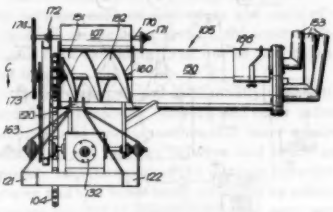
a first strap element which is adapted to closely surround the heel of the foot to retain said cup-shaped member in close relation to the toes.

4,495,716

APPARATUS FOR HARVESTING PEAT

Michael Finan, Ballintubber; Peter Finan, Ballymoe, and Michael Divilly, Glenamaddy, all of Ireland, assignors to Ballintubber Enterprises Limited, Ireland

Continuation of Ser. No. 373,567, Apr. 30, 1982, abandoned. This application Feb. 7, 1984, Ser. No. 577,914
Claims priority, application Ireland, Jun. 10, 1981, 1279/81
Int. Cl.³ E21C *49/00*
U.S. Cl. 37—3 **9 Claims**



1. Peat cutting apparatus comprising:

(a) a support frame;

(b) a boom connected to the support frame and movable between a transport position and an operational position, the boom comprising an elongate endless cutting chain for cutting peat and delivering the cut peat to a position above the boom;

(c) peat deflecting means above the boom and in the path of the delivered peat and defining a moving surface for deflecting the delivered peat;

(d) an extrusion press mounted to one side of the boom, the extrusion press comprising a housing having (i) a collection aperture in the roof of the housing and in the path of the deflected peat, (ii) an exit aperture, and (iii) an auger rotatable in the housing for delivering the collected peat to the exit aperture and for extruding the delivered peat through the exit aperture; and

(e) drive means for operating the cutting chain, the auger and the moving surface;

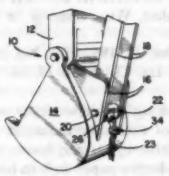
the support frame being connectable to a prime mover for conveying the apparatus over a bog, for operating the drive means and for swinging the boom between its operational and transport positions.

4,495,717

COMBINATION SPACER AND LIFTING DEVICE FOR BACKHOE MACHINERY

Michael Lockwood, 623 1/3 E. Haley St., Santa Barbara, Calif. 93103

Filed Dec. 30, 1982, Ser. No. 454,661
Int. Cl.³ E02F *3/76*
U.S. Cl. 37—117.5 **3 Claims**



1. In combination

(a) an arm supported backhoe bucket having two laterally spaced protruding plates which extend in vertical planes, said bucket having an outer surface which is convexly

curved downwardly, and from a location between said plates,

(b) a tubular sleeve extending laterally and having a lateral axis and confined endwise between said flanges, and a pin extending laterally through the sleeve and carried by the plates so that the sleeve may rotate about the pin,

(c) a tab integral with the sleeve and extending downwardly therefrom, outwardly of said bucket surface,

(d) a hook having a stem pivotally attached to said tab to hang downwardly outwardly of but close to the bucket surface between said plates,

(e) a chain having a link engaging and carried by said hook, the chain extending downwardly to freely and variably engage said bucket curved surface as the bucket is lifted and lowered by said arm supporting the bucket,

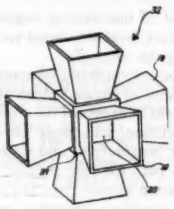
(f) the stem having two upwardly projecting yoke arms forming a space therebetween, the tab projecting downwardly in a plane which is normal to said plates to extend between the yoke arms for pivotal connection therewith and about an axis which extends forwardly from the bucket surface, a vertical plane through said forward axis extending normal to the lateral axis of the sleeve.

4,495,718

PHOTOGRAPHIC DISPLAY DEVICE

Benjamin Margalit, 3165 Meadowbrook Blvd., Cleveland Heights, Ohio 44118

Filed May 27, 1983, Ser. No. 498,983
Int. Cl.³ A47G *1/06*
U.S. Cl. 40—152.2 **22 Claims**



1. A display structure for artwork embodied upon a light transmitting substrate comprising:

a hollowed frustum having a closable end opposing an open end, the hollowed frustum being defined by a structural material interconnecting the ends and providing any closing of the closable end, thereby defining inner and outer surfaces of the hollowed frustum;

a circumference of the open end being greater than a corresponding circumference of the closable end;

the structural material of the frustum and the closed end being a substance substantially transmitting light; and

the light transmitting artwork substrate being applied to portions of at least one of the surfaces, configured for viewing from inside the hollowed frustum via the open end.

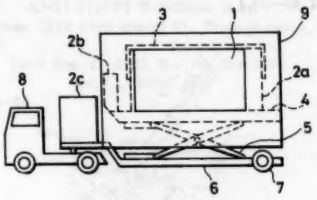
4,495,719

MOVABLE DISPLAY APPARATUS

Shunichi Futatsuishi; Shozo Fujita, and Takashi Takushima, all of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 363,687
Claims priority, application Japan, Mar. 2, 1981, 56-30064[U]
Int. Cl.³ G09F *21/04*
U.S. Cl. 40—590 **3 Claims**

1. A moveable display apparatus comprising a display board having a vertically disposed flat display surface mounted on a vehicle for supplying information to a large audience, lift means for raising and lowering said display board relative to said vehicle, and a plurality of flat plate members moveably associated with said display board, said flat plate members being assembled around said vertical display surface of said display board in parallel flush relation thereto when said display board is disposed in the raised position for hiding said lift



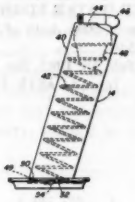
means and providing a peripheral frame for said display surface and said flat plate members being assembled about said display board in the lowered position to cover said display board to protect said display board from damage during transport.

4,495,720

HANDGUN MAGAZINE WITH POMMEL BASE

Robert Bross, Ballville Rd., Bolton, Mass. 01740

Filed Dec. 1, 1982, Ser. No. 445,925
Int. Cl.³ F41C *25/00*
U.S. Cl. 42—7 **8 Claims**



1. Means for mounting a pommel to a cartridge magazine which is slidable into a recess in a butt end of a grip of a handgun, the magazine having a cartridge discharging end and a closed end,

the pommel having a first surface engageable with the butt end of the grip and a smooth continuous, uninterrupted surface opposite the first surface, a recessed interior formed in the first surface and an exterior periphery complementary to and coincident with the shape of the butt end of the grip of the handgun,

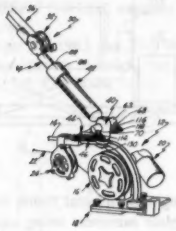
a releasable interlock means on the closed end of the magazine and complementary releasable interlock means wholly within the internal confines of the recessed interior of the pommel,

whereby the pommel and the magazine may be secured together with said interlock means completely obscured from view when the magazine is inserted into the grip of the handgun and only the interrupted surface and the exterior periphery of the pommel are visible.

4,495,721
ROD HOLDER ASSEMBLY

John E. Emory, Jr., Traverse City, Mich., assignor to Big Jon, Inc., Traverse City, Mich.

Filed Jul. 11, 1983, Ser. No. 512,360
Int. Cl.[3] A01K *97/10*
U.S. Cl. 43—21.2 16 Claims

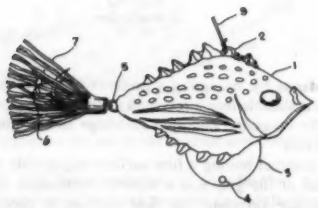


1. A rod holder assembly primarily adapted for use with a downrigger to position a fishing rod having a line releasably secured to a downrigger line, said holder comprising:
- a base, said base having a mounting portion, a bifurcated upper portion defining a slot and a throughbore extending through said upper portion and transversely of said slot;
- a cylindricl rod holder member having an open end adapted to receive a fishing rod;
- a pivot pin extending through said bore in said bifurcated upper portion of said base, said rod holder being secured to said pivot pin within said slot;
- a bracket extending from said base; and
- spring means attached to said bracket for biasing said pivot pin and said holder to a strike position away from said bracket, said rod holder being movable from said strike position to a set position against the bias of said spring means.

4,495,722
DEEP WATER FISHING LURE

Dean Hess, and Karen Hess, both of 3879 Modesto St., Castro Valley, Calif. 94546

Filed Feb. 10, 1983, Ser. No. 465,441
Int. Cl.[3] A01K *85/00*
U.S. Cl. 43—42.39 6 Claims



1. A bottom fishing lure, comprising:
- an elongated solid body weighing not substantially less than one pound, said body being fabricated from material having a density approximately equal to that of heavy metal;
- line-attachment means affixed on the upper surface of said body, such that a fishing line may be attached to said body;
- hook means attached to one end of said body; and
- fin means rigidly attached to the lower surface of said body, said fin means forming a foil structure extending below said body along the vertical line passing through the center of gravity of said body when said lure is suspended by said fishing line in water, wherein said foil structure comprises a vertical planar foil parallel to the longitudinal axis of said body, said foil having an edge that is substantially semicircular in shape of diameter approximately one-third the length of said body and being located directly below the center of gravity of said lure, such that when said lure is jigged and descends in the water said fin means tends to cause said lure to invert its orientation by rotating 180 degrees about a horizontal axis.

4,495,723
METHOD OF PREVENTING FROST DAMAGE OF VEGETATION

Kurt J. Wasserman, Westtown, N.Y., assignor to Phase Change Technology, Inc., Port Jervis, N.Y.

Filed Jul. 25, 1983, Ser. No. 516,918
Int. Cl.[3] A01G *13/00*
U.S. Cl. 47—2 19 Claims

1. The method of maintaining vegetation above the frost damage temperature level associated with the particular vegetation comprising the steps of:
- a. in an outdoor environment, substantially surrounding said vegetation with an encased phase change material having a melting point in excess of the frost damage temperature for the vegetation, said phase change material being in heat transfer proximity to said vegetation;
- b. providing a path for heat transfer fluid to circulate between a location remote from the vegetation and a location in heat transfer relationship with said phase change material;
- c. collecting solar thermal energy, when available, at said remote location;
- d. heating said fluid at said remote location with said collected thermal energy to a temperature in excess of said melting point;
- e. recirculating said heated fluid along said path for a sufficient time to melt said phase change material with thermal energy from said fluid; and
- f. heating said vegetation with thermal energy released by said phase change material in response to ambient temperature dropping below said melting point.

4,495,724
PRODUCT AND METHOD OF MAKING A SEED COATING FOR INCREASED YIELD

Edmund R. Kirkland, Rte. 3, Box 342, Lumberton, N.C. 28358; Elko Palanuik, P.O. Box 910, and Harlan V. Ingman, Rte. 3, both of, Belfield, N. Dak. 58622

Continuation-in-part of Ser. No. 251,097, Apr. 6, 1981, abandoned. This application Jun. 16, 1983, Ser. No. 504,085
Int. Cl.[3] A01C *1/06*
U.S. Cl. 47—57.6 17 Claims

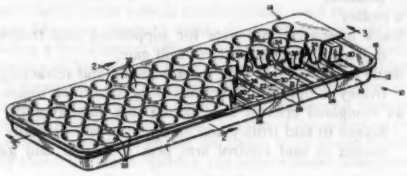
1. A method of making a seed coating which will increase the percentage of seeds germinated and decrease germinating time comprising:
- mixing dry powdered graphite with a dry hygroscopic material to form a uniform mixture in which said dry powder graphite is from about 10% to about 25% by weight of the mixture.

4,495,725

SEED GERMINATING APPARATUS AND METHOD

Gene B. Talbott, Rte. 2, Box 200, Banks, Oreg. 97106

Filed Mar. 12, 1984, Ser. No. 588,560
Int. Cl.[3] A01G 9/82
U.S. Cl. 47—85 8 Claims



1. Apparatus for growing plants, comprising:

a pan having a floor with a plurality of raised projections defining trough regions therebetween and being adapted to hold plant watering fluid at a predetermined level relative to the upper periphery of said projections; and

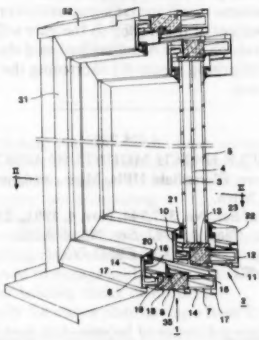
an insert for the pan having a plurality of spaced, downwardly extending cells, the position of which corresponds to the position of said projections, each said cell including a bottom defining an opening, said insert being shiftable between a first position in which said bottoms are disposed in said trough regions below the level of the fluid so that the fluid can enter the openings, and a second position in which at least some of said bottoms rest upon said projections such that said openings are less than fully obstructed by said projections so that excess fluid within said cells can drain therefrom.

4,495,726

SILL AND FRAME FOR WINDOWS OR DOORS

Wictor C. O. Lindström, Furulund, Sweden, assignor to Credence Finance Association, St. Mary, Channel Islands

Filed Nov. 8, 1982, Ser. No. 440,165
Claims priority, application Sweden, Nov. 9, 1981, 8106614
Int. Cl.[3] E05D 7/00
U.S. Cl. 49—401 11 Claims



1. A sill and frame construction for windows or doors comprising:

a sill;

a frame;

each of said sill and said frame having front and rear sections, and connecting means for connecting said front section to said rear section;

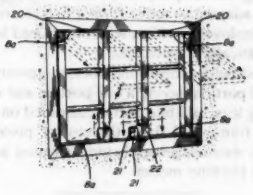
wherein each of said sections is formed by roll forming and comprises two shanks and a transition portion connecting the shanks to each other, said shanks being disposed close to each other in proximity to said transition portion to provide a double-walled support portion for retainment of a seal and wherein said shanks are extended from the support portion into coupling portions for connecting said shanks to said connecting means.

4,495,727

ANTI-THEFT WINDOW BAR

Réjean Gelinas, 2519 Père Daniel St., Trois-Rivières, Canada G8Z 2K7

Filed Jun. 17, 1983, Ser. No. 506,397
Int. Cl.[3] E06B 3/68
U.S. Cl. 49—56 1 Claim



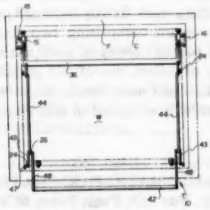
1. An anti-theft window guard for securing to a window frame, comprising two laterally-spaced hollow posts; a holder element associated with both opposite ends of said two posts; each said holder element having an outer flat seating flange adapted to extend within said window frame and two spaced dowel pins extending away from said flange and slidably extending within respective ends of said hollow posts, rod members slidably extending at least partially through holes made therefor in each said vertical post, with said rod members extending transversely of said posts, whereby a rigid grill structure can be formed in said window frame from separate holder elements, hollow posts and rod members, those of said holder elements at the top of said grill structure having hinges to hingedly secure said last-named holder elements to the upper rail of said window frame, and further including lock means to releasably keep the grill structure in operative position within the window frame, said lock means comprising an L-shape tab adapted to be secured to the lower rail of said window frame adjacent the lower end of one of said posts and having an upstanding portion formed with a hole, a collar member slidably surrounding said one of said posts and provided with a laterally-extending flange portion provided with a hole adapted to register with the first-mentioned hole; said two holes, when in registry, adapted to receive the bolt of a padlock.

4,495,728

WINDOW ESCAPE DEVICE

Gary Lynn, Box 2042, Boulder, Colo. 80306

Filed Mar. 17, 1983, Ser. No. 476,109
Int. Cl.[3] E05B 65/10
U.S. Cl. 49—141 14 Claims



1. A device for facilitating egress form a window comprising in combination:

latching means adjacent a top area of the window cooperating with latch retention means disposed on an associated window frame upper portion in registry with said latching means,

fastening means removeably interconnecting a lower area of the window with the adjacent associated window frame lower portion,

whereby activation of said latching means allows the window to move in relation to the frame initially and thereafter allow dissociation of the window from the frame through said fastening means separation,

said latching means operatively conditioned by ladder means which is adapted to move form a first stored position to a second deployed position whereupon said latching means is automatically tripped, and

wherein said ladder means includes an upwardly extending U shaped portion having a bite portion and two upwardly extending legs, said bite portion disposed on a ledge of the window frame and fixed thereto by pivot means, said upwardly extending legs having termimi adapted to engage said latching means.

4,495,729

PIVOTABLE SLIDING DOOR FOR VEHICLES

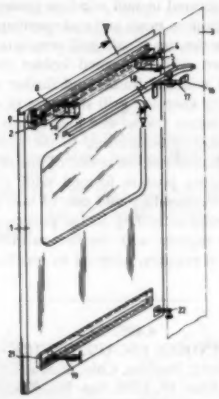
Ingo Britzke, Kassel, and Dietmar Dilcher, Veilmar, both of Fed. Rep. of Germany, assignors to Gebr. Bode & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,628

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049189

Int. Cl.³ E05D *15/10*

U.S. Cl. 49—212 **7 Claims**



1. A pivotable sliding door apparatus in the door frame of a vehicle comprising: a pivotable main track mounted upon the door frame; a running track fixedly mounted on the door panel; and a suspension means comprising two staggered and connected elongated partial carriages, said partial carriages each having a plurality of rollers, one of said partial carriages being rollably mounted in said main track, the other of said partial carriages being rollably mounted in said running track.

4,495,730

AUTOMATIC FARM GATE

James R. Kennedy, Box 169, Page, Nebr. 68766

Filed Sep. 1, 1983, Ser. No. 528,614

Int. Cl.³ E05D *7/06*

U.S. Cl. 49—280 **11 Claims**

1. An automatic gate assembly, comprising

an elongated gate having top and bottom edges and opposite ends,

means hingedly suporting one end of said gate for swinging movement of the gate between open and closed positions,

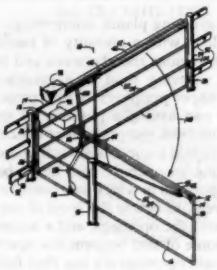
a control arm post secured to the ground at a position in spaced relation from the plane of said gate in its closed position,

a trolley,

track means on said gate for supporting said trolley for movment longitudinally of said gate,

drive means on said gate for advancing and retracting said trolley in opposite directions along said track means,

an elongated control arm having one end pivotally connected to said trolley and an opposite end pivotally connected to said control arm post such that said gate is



constrained to swing to its open position in response to advancing movement of said trolley to a gate open position and to swing to its closed position in response to retracting movement of the trolley to a gate closed position,

a latch supported on the opposite end of the gate for movement between latched and unlatched positions,

means for moving said latch to the latched position in response to overtravel retracting movement of the trolley beyond said gate closed position, and

slack adjustment means for taking up said overtravel retracting movement of the trolley so the gate will remain in its closed position while being latched said slack adjustment means comprising means for shortening the length of said control arm.

4,495,731

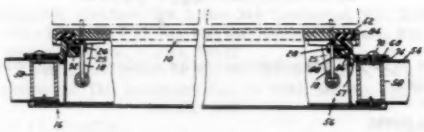
VEHICLE HATCH MOUNTING ASSEMBLY

Ronald E. Sears, Bloomfield Hills, Mich., assignor to Transpec, Inc., Troy, Mich.

Continuation of Ser. No. 317,944, Nov. 4, 1981,. This application Nov. 1, 1982, Ser. No. 438,511

Int. Cl.³ E05D *7/00*

U.S. Cl. 49—402 **6 Claims**



1. In an assembly of the type for mounting an outwardly opening hatch (10) in a passenger vehicle enclosure or the like, said assembly including a mounting ring (16), said ring having an integral continuous sealing flange portion (76) having one edge (78) thereof disposed outwardly and laying in a common plane to form a hatch sealing edge, said mounting ring includ-

ing a locating flange (57) for centering the sealing flange with a vehicle hatch opening (56), said ring having an integral mounting flange portion (68) extending laterally outwardly from the sealing flange portion for overlaying the outside marginal edge of the hatch opening, and a plurality of hinge devices (12 and 14) respectively connected both to the hatch and the mounting ring to permit the hatch to be opened and closed relative to the vehicle hatch opening, each hinge device (12 and 14) being disposed within the hatch opening (56) and including a first member (25) fixed to the interior of the hatch, a plurality of hinge supporting elements (88, 90, 92, 94) integrally formed on and projecting laterally inwardly from said mounting ring, each hinge device including second members (18 and 20) pivotally connected to various of the mounting ring supporting elements to enable the hatch to be raised equidistantly above the hatch opening, the improvement comprising:

a. a downwardly opening bezel receiving pocket (86) formed in the sealing flange of the mounting ring, and

b. a trim bezel (100) of generally L-shaped configuration having a laterally extending first flange (102) adapted to overlie the inner surface of the vehicle at the marginal edge of the opening (56) in which the hatch mounting assembly is disposed, said bezel including a second flange (108) projecting upwardly within the bezel receiving pocket of the mounting ring whereby the trim bezel conceals the edge of the hatch opening and trims the same.

4,495,732

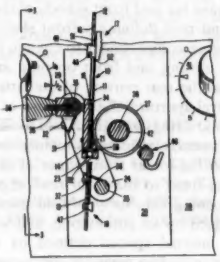
SEMICONDUCTOR WAFER SECTIONING MACHINE

Roger S. Turner, 620 Carpenter La., Philadelphia, Pa. 19119

Filed Sep. 13, 1982, Ser. No. 416,975

Int. Cl.³ B24B *5/36*

U.S. Cl. 51—91 R **10 Claims**



1. In a sectioning machine of the type having an abrasive tool rotatably mounted on a housing and having a wafer holding chuck adapted to engage a wafer in uniform line contact with said abrasive tool comprising:

a fixed housing,

an abrasive tool rotatable mounted on said housing,

a wafer holding chuck mounted on said housing and adapted to be moved to engage said wafer with said abrasive tool, said wafer holding chuck comprising,

a substantially flat chuck plate having a front face juxtaposed said abrasive tool and adapted to support a wafer to be sectioned thereon,

resilient strip means on said front face of said chuck plate parallel to the rotational axis of said abrasive tool and adapted to engage and movably support the rear surface of a wafer thereon which is spaced apart from and adjacent to said front face of said chuck plate,

edge fastening means for positioning and holding said wafer into engagement with said resilient strip means, and

upon engagement of said abrasive tool against said wafer, said wafer supporting resilient strip means compresses and permits the front face of said wafer to conform and self align to and to make uniform line contact with said abrasive tool.

4,495,733

SCANNING FINGER FOR A SCANNING DEVICE OF A MACHINE FOR THE AUTOMATIC SHARPENING OF BROACHING OR REAMING TOOLS

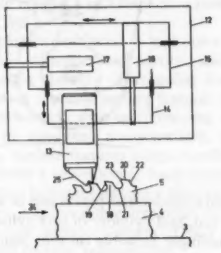
Roland Börner; Herbert Holstein, and Jürgen Sennewald, all of Solingen, Fed. Rep. of Germany, assignors to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH & Co. KG, Solingen, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 399,884

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131557

Int. Cl.³ B24B *49/00*

U.S. Cl. 51—165 R **4 Claims**



1. An apparatus for use in a scanning device of a machine for the automatic sharpening of a cutting tooth of a tool said cutting tooth having a free face, a cutting face and a rounded-off cutting edge, which machine has a horizontal slide for receiving said tool having cutting teeth to be sharpened and a vertical slide provided with at least one grinding spindle, said apparatus comprising a scanning finger movable relative to the scanning device and coupled to at least one member for emitting signals in a displacement-dependent manner for triggering drive mechanisms for said slides; the scanning finger including:

(a) a scanning face having a scanning edge being undercut to form (b) an undercut face, said undercut face defined at one end by said scanning edge and at the other end by (c) a measuring edge, for resting on said tooth cutting face, extending upwardly from (d) a face downwardly offset from the scanning face and intended for ascertaining the cutting face of the cutting tooth;

said undercut face extending for a distance so that the horizontal distance between said measuring edge and said scanning edge is larger than the largest possible rounding-off of the cutting edge, said scanning edge being capable of resting upon said free face of said cutting tooth.

4,495,734

GRINDING ARRANGEMENT FOR CHOPPING CUTTER OF DRUM-CHOPPER MACHINE

Hans Rauch, Saulgau, Fed. Rep. of Germany, assignor to Claas Saulgau GmbH, Saulgau, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,446

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1981, 3146433

Int. Cl.³ B24B *3/55*

U.S. Cl. 51—249 **14 Claims**

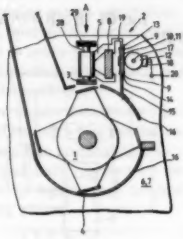
1. An arrangement for grinding a chopping cutter of a drum-chopper machine having a chopper drum rotatable about an axis, the arrangement comprising

a grinding tool;

a grinding carriage which carries said grinding tool and is reciprocable parallel to the axis of rotation of the chopper drum over a length of the latter;

drive means for driving said grinding carriage and including a double-acting cylinder-and-piston unit with a cylinder movable parallel to the axis of rotation of the chopper drum;

control means for reversing a direction of movement of said cylinder of said cylinder-and-piston unit and including a control valve connected with said cylinder and two abutment members located at opposite sides of said control valve, as considered in the direction of movement of said cylinder, and arranged so that when said control member meets a respective one of said abutment members the direction of movement of said cylinder is reversed; and



wherein said cylinder-and-piston unit of said drive means has a piston rod, said cylinder of said cylinder-and-piston unit being guidingly movable on said piston and having two ends provided with deflecting wheels and a dragging member moving around the latter, said dragging member having one run which is fixedly supported and another run which is connected with said grinding carriage for driving the latter.

4,495,735

UNITARY RACK WITH LATCH MEANS

Johnny C. Elkins, P.O. Box 2599, San Angelo, Tex. 76902

Continuation-in-part of Ser. No. 244,219, Mar. 16, 1981, Pat. No. 4,402,164. This application Sep. 2, 1983, Ser. No. 529,138

Int. Cl.³ A47F *5/08*

U.S. Cl. 52—27 **10 Claims**

1. In a window frame having a gasket which encapsultes one marginal end therof, a glass having a marginal edge portion encapsulated within the gasket; the glass, gasket, and frame being fixed respective to one another, the combination with said window frame, glass, and gasket of a rack;

said rack includes a main body having a lip formed at the upper end thereof and a hook formed at the lower end thereof, said lip extends laterally from said main body in opposition to said hook, said hook is in the form of an upwardly opening curved configuration and is adapted to support articles which can be hung thereon;

said lip is bent into an acute angle respective to the main body, siad lip curves about and bears against an upper longitudinally extending edge portion of the window frame; and the lip, and adjacent marginal end portion of the rack is encapsulated within the gasket;

said main body, including said lip and hook, are of unitary construction.

4,495,736

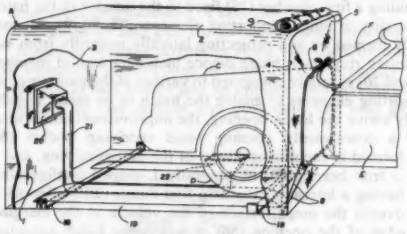
AUTOMOBILE SHELTER

André Lamontagne, 1083A, boul. Saint-Joseph, Charlesbourg West, Quebec, Canada (G2K 1G3)

Filed Feb. 24, 1983, Ser. No. 469,156

Int. Cl.³ E04B *1/34*

U.S. Cl. 52—63 **2 Claims**



1. A shelter for automobiles having an engine compartment and a passenger compartment, said shelter of sufficient height, width and depth to house said engine compartment with the front wheels of the automobile, said shelter including two lateral walls, a rear wall, a roof, said roof including two sections joined one to the other along the longitudinal axis of said roof, each section being integral with one of said lateral walls, said rear wall consisting of a panel fixed to the rear edge of the two half-sections in a dismantable manner, braces detachably connected to the lower edge of said lateral walls and transversely extending along the ground, parallel separate running boards longitudinally positioned relative to the shelter to be used as path-ways for said front wheels of the automobile, said lateral walls and roof defining a front shelter opening which allows said engine compartment to engage into said shelter, a membrane for closing said front opening around said engine compartment at the rear portion of the latter, said membrane defining a central aperture, the periphery of which being provided with elastic strings to tighten said membrane around said engine compartment, elastic bands joining the lower corners of said aperture to the lower front edges of said lateral walls, a flexible closure, fixed to the front roof edge, and capable of closing said opening exteriorly of said membrane when said shelter is not used by an automobile, and warming means to warm up the internal spaced defined by said shelter, said warming means including means to discharge an upward flow of warm air located between said running boards and under said engine compartment when the latter is inside said shelter.

4,495,737

DEFORMABLE SEAL OF THE GAP BETWEEN A BUILDING OPENING AND A VEHICLE DRIVEN UP TO IT

Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,580

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1981, 3130657; Jan. 25, 1982, 3202252

Int. Cl.³ E04H *14/00;* **E01D** *1/00*

U.S. Cl. 52—173 DS **5 Claims**

1. A deformable seal for a gap between the edges of an opening of a building and a back end of a vehicle driven up to a location adjoining said opening, said seal in combination therewith comprising:

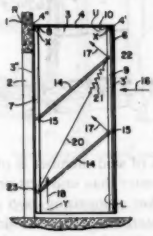
a rigid inverted U-shaped frame which is spaced from the building, said frame having a U-shape open at the bottom;

two inclined parallel guides each having a first end connected to said frame and a second end which is operatively connected to the building and which is unchangeable in height thereof at the second end thereof where said

guides connected to the building are also rigidly fixed to the frame;

an apron having a first outer edge fastened to said frame and having a second edge thereof directed inwardly for effecting sealing with the vehicle; and

a resilient yieldable covering located between said apron and the building as well as being provided along two sides thereof as well as along the upper edge of the apron, which covering is fastened with one edge thereof secured to said frame and with the other second edge thereof being fastened to the building, the edge toward the building of



said covering being fixed only at an upper edge thereof and in a remaining range thereof, however, being guided in a height adjustable manner and, furthermore, said rigid guides being provided therewith; a tension apring intregrally connected to a cable forming a first end and a second end, said tension spring and cable extending between the two parallel guides, the first end of said spring and cable being secured to the first end of one of the guides at said frame, the second end of said spring and cable being secured to the other guide, said other guide being adjacent to and connected to the building.

4,495,738

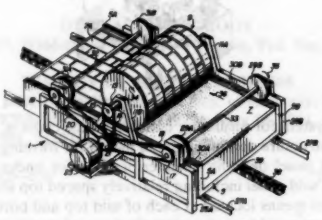
EMBOSSED CONCRETE BUILDING PANELS

Thomas F. Sheber, 640 W. Chapala Dr., Tucson, Ariz. 85704

Continuation of Ser. No. 218,835, Dec. 22, 1980, abandoned, which is a division of Ser. No. 960,041, Nov. 23, 1978, Pat. No. 4,271,111. This application Jun. 8, 1982, Ser. No. 386,329

Int. Cl.³ E06B *1/24;* B44F *7/00;* E04B *2/64*

U.S. Cl. 52—204 **5 Claims**



1. A pre-formed concrete building panel comprising in combination:

(a) a concrete wall section having a height, a width and a thickness, said wall section including an outer surface and an inner surface, said wall section also having an upper edge and an opposed lower edge and first and second opposed vertical edges;

(b) a plurality of vertical tapered reinforcing concrete ribs integral with the concrete of said wall section and extending along said inner surface, said reinforcing ribs extending substantially perpendicularly from said inner surface by a distance greater than said thickness, said reinforcing ribs each having at least one tapered side and an outermost flat surface substantially parallel to said inner surface.

(c) reinforcing mesh means disposed in the concrete of said wall section for reinforcing concrete of which said wall section is composed;

(d) a plurality of reinforcing bars disposed, respectively, in said reinforcing ribs for reinforcing concrete of which said reinforcing ribs are respectively composed;

(e) a plurality of nailing strips disposed along said respective outermost surfaces of said reinforcing ribs;

(f) anchoring means for anchoring said nailing strips to said respective outermost flat surfaces of said reinforcing ribs, said anchoring means extending into and being anchored into the concrete of which said respective reinforcing bars are composed; and

(g) a decorative pattern embossed in said outer surface and integral with said concrete wall section, said decorative pattern including a plurality of irregular, non-repetitive, non-uniform raised concrete surface features on said outer surface that are integral with said concrete wall section, said plurality of irregular, non-repetitive, non-uniform raised concrete surface features being transferred to said outer surface from a pre-existing, hand-crafted wall surface and therefore being substantially identical to a plurality of precisely corresponding irregular, non-repetitive, non-uniform raised surface features of said hand-crafted pre-existing wall section, respectively.

4,495,739

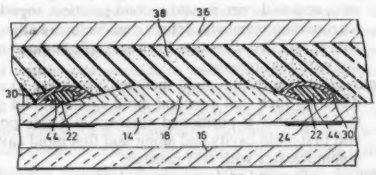
BEVELLED GLASS WINDOW

Frank E. Drennan, Etobicoke, Canada, assignor to Dor Seal Limited, Toronto, Canada

Continuation-in-part of Ser. No. 258,060, Apr. 28, 1981,. This application Nov. 18, 1983, Ser. No. 552,928

Int. Cl.³ E04C *1/42*

U.S. Cl. 52—308 **2 Claims**



1. A window having multiple individual lites with configurations defined by came, said individual lites including marginal edges at multiple different elevations, comprising:

(a) a base pane having a plane surface;

(b) at least one window lite comprising a decorative pane having a thickness of about ¼ of an inch at its marginal edge areas laminated to the surface of the base pane in the configuration of one of said multiple lites;

(c) a channeled came comprising individual came lengths jointed at their ends and shaped to define the marginal edges of the configurations of said lites, and said lengths of came comprising channels having longitudinal flanges therewithin which extend inwardly of the came below the channels;

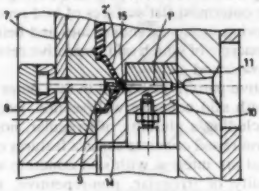
(d) the edges of the lengths of came being fitted to conform with the surfaces of the marginal areas of the lites including said different elevations of the decorative pane marginal areas and the surfaces of the base pane, all of the edges of the came lying flat against the associated marginal surfaces of the lites along their entire lengths, the edges which overlie decorative pane areas being elevated above the plane of the surface of the base pane; and

(e) adhesive in the channeled came securing the came to the panes, whereby the came ornamentally divides the face of the window into said configurations.

4,495,740
WINDOW WITH INTEGRAL MOLDED FRAME AND PROCESS FOR MAKING SAME

Jean-Michel Sarrazin, Sainte Luce sur Mer, and Bernard Chessel, Bagneux, both of France, assignors to Compagnie des Produits Industriels de l'Ouest, Nantes, France

Filed Jul. 14, 1982, Ser. No. 398,411
Claims priority, application France, Jul. 17, 1981, 81 13996
Int. Cl.³ E04C *2/20*; B29D *9/00*, *31/00*; B29C *1/14*
U.S. Cl. 52—309.1 **2 Claims**



1. In a process for molding and assembling a unitary transparent plastic window and stile assembly, the steps comprising:
forming a first elongated mold cavity;
positioning a movable rod in a first position in said first mold cavity, said movable rod having a core positioned at a side portion of said first mold cavity;
positioning a movable mold member in a first position such that said movable mold member closes said side portion of said first mold cavity;
filling said first mold cavity with a first hardenable plastic material selected for strength;
permitting said first material to harden so as to form said stile;
moving said rod in a first direction from said first position to a second position, such that a space occupied by said core in said first position defines an open passage through said stile, and said core in said second position, together with surrounding members, defining an enclosure adjacent said stile in said first direction from said stile and communicating with said passage;
moving said movable mold member transverse to said first direction such that a second mold cavity in said movable mold member is positioned adjacent said side portion of said first mold cavity and along said first mold cavity, and communicates with said passage;
filling said second mold cavity, said passage and said enclosure with a second transparent plastic material which welds with said first material upon hardening; and
permitting said second material to harden and weld with said first material to form said assembly, with said window being interlocked with said stile through said passage.

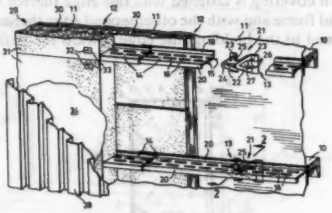
2. Unit of at least two plastic parts, wherein said parts are molded and assembled according to the method of claim 1.

4,495,741
ADJUSTABLE SPACER KIT OF PARTS, AND BUILDING WALL OR ROOF STRUCTURE INCORPORATING THE SAME

Eugene Pasiecznik, Hamilton, Canada, assignor to Westeel-Rosco Limited-Westeel-Rosco Limitee, Toronto, Canada

Filed Jul. 26, 1982, Ser. No. 401,940
Int. Cl.³ E04B *1/74*
U.S. Cl. 52—404 **10 Claims**

1. An adjustable spacer kit of parts comprising a member having a first edge portion and an opposed second edge portion and having at least one hole provided therein, and a bracket having a first end portion and an opposed second end portion and presenting a projecting tab spaced from the first end portion of said bracket, the first edge portion of said member presenting a projecting flange, said member being adapted to be mounted on said bracket in one of a plurality of alternative positions which compise a first position in which the tab projects through the hole in said member whereby the spacing between the first end portion of said bracket and the second edge portion of said member is of a first predetermined magnitude, and a second position in which the flange of said member is in abutting contact with the tab of said bracket whereby the spacing between the first end portion of said bracket and the

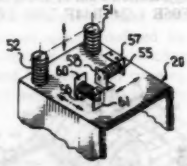


second edge portion of said member is of a second pre-determined magnitude greater than said first pre-determined magnitude, and said bracket comprising two spaced, parallel side plates, and a web interconnecting the side plates only at the second end portion of said bracket, with the tab being presented by the web of said bracket.

4,495,742
THERMAL INSULATING SYSTEM PARTICULARLY ADAPTED FOR BUILDING CONSTRUCTION

Harrison G. Dyar, P.O. Box 185, Tampa, Fla. 33601

Continuation of Ser. No. 312,287, Oct. 15, 1981, abandoned, which is a division of Ser. No. 215,083, Dec. 10, 1980, Pat. No. 4,334,395. This application Nov. 15, 1983, Ser. No. 552,011
Int. Cl.³ E04B *1/78*
U.S. Cl. 52—407 **2 Claims**

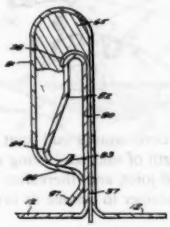


1. A system for insulating building walls, ceilings, floors or the like structure comprising wall means for forming a hollow insulated panel defining an interior chamber under negative pressure, said panel including relatively spaced top and bottom walls, first means located at each of said top and bottom walls for supporting said panel against the force of gravity and maintaining said panel in generally spaced relationship from an associated building wall, ceiling, floor or like structure, second means located at each of said top and bottom walls for limiting movement of said panel in a first direction generally normal to the direction of the effect of gravity, third means located at each of said top and bottom walls for limiting movement of said panel in a second direction generally normal to said first direction, each of said first, second and third means include at least one coil spring located at each of said top and bottom walls, and axes of said coil springs at each top and bottom wall are all normal to each other and occupy one each of X, Y and Z axes.

4,495,743
STANDING SEAM ROOF SYSTEM

Burlan E. Ellison, Duluth; Harry P. Spranca, Dunwoody, and Christopher C. Hooper, Decatur, all of Ga., assignors to Atlantic Building Systems, Inc., Atlanta, Ga.

Division of Ser. No. 56,943, Jul. 12, 1979, Pat. No. 4,361,998.
This application Dec. 6, 1982, Ser. No. 447,213
Int. Cl.³ E04B 5/52
U.S. Cl. 52—478 8 Claims



1. A standing seam fastening assembly for fastening adjacent sheet metal panels together along adjacent longitudinal edges thereof, the panels extending generally in a first plane; said assembly comprising

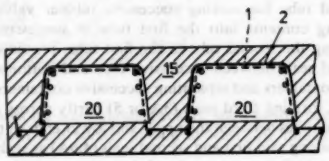
one of the panels having a first raised edge comprising a male locking member including an upstanding portion extending generally perpendicular to said first plane, a downturned end parallel to but spaced from said upstanding portion, and a bulge extending outwardly from the downturned end away from said upstanding portion continuously along substantially the entire length of the panel, said bulge having a rounded bottom surface adjacent a terminating edge thereof; and

the other of the panels having a second raised edge, at an end thereof, comprising a female locking member including an upstanding portion extending generally perpendicular to said first plane and parallel to the male locking member upstanding portion; a downturned portion parallel to the male locking member downturned portion and connected thereto by a rounded bend; and an inwardly turned elongated flat portion immediately adjacent said end thereof and having an extent greater than the width of said panel, and abutting said rounded bottom surface of said continuous bulge of said male locking member and providing locking interfering engagement therewith.

4,495,744
DISPLACEMENT BODY

Heinz Carl, Waldstrasse 16, D-8644 Pressig, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,605
Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3119703; May 18, 1981, 3119704; May 18, 1981, 3119705; Jul. 23, 1981, 3129165
Int. Cl.³ E04C 1/06
U.S. Cl. 52—576 15 Claims

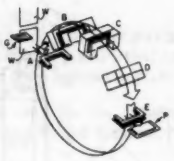


1. A displacement body for forming a cavity in a concrete structure and comprising: at least one hollow section in the shape of said cavity, said hollow section comprising a wall determining the contours of said cavity, characterized in that said wall comprises a grid structure (1) formed of construction steel mat and a flexible plastic shrinkable sheet (2a) covering the side of said grid structure facing towards the concrete and attached to said grid structure by being shrunk thereonto so as to close at least some of the grid openings.

4,495,745
SEALING WHEEL FOR FORMING FIN SEAL PACKAGE

Francis C. Crescenzo, Springfield, and Paul J. LaFleur, Jr., Wilbraham, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Division of Ser. No. 107,174, Dec. 26, 1979, Pat. No. 4,346,545.
This application Aug 27, 1982, Ser. No. 412,108
Int. Cl.³ B65B 11/28, 57/00
U.S. Cl. 53—77 13 Claims



1. A sealing wheel comprising a wheel body, drive means for rotatably indexing said wheel body, means on said wheel body defining a plurality of angular spaced radially outwardly opening pockets for receiving articles and wrappers therein, a plurality of sets of opposing sealing jaws supported on said wheel body, the jaws of each of said sets being supported on said wheel body in association with one of said pockets for movement between open and closed positions, means for heating at least one of the jaws of each of said sets, means for moving said jaws between open and closed positions in response to said indexing movement of said wheel body, said jaws in said closed positions being engageable with marginal portions of wrappers disposed within said pockets to seal said marginal portions, sensing means for detecting an interruption of predetermined duration in the cyclical movement of said wheel body, and shut-down means for simultaneously moving all of said jaws in said closed position to said open position and including a shut-down member operably associated with said jaws and supported for coaxial angular movement with and relative to said wheel body and means for angularly moving said shut-down member relative to said wheel body to open said jaws in response to the detection of an interruption of a predetermined duration by said sensing means.

4,495,746
PACKAGING APPARATUS FOR PRODUCING AND FEEDING BLANKS TO A PACKAGING STATION

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,148
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131687
Int. Cl.³ B65H 41/00, 5/22
U.S. Cl. 53—389 16 Claims

1. A packaging apparatus for severing successive blanks (11) of desired length from a continuous web (14) of thin and delicate wrapping material and for individually conveying the blanks in succession to a packaging station (12, 13), comprising:

(a) a rotatably driven, perforate suction drum (17),

(b) means (15, 16) for supplying said web to the suction drum,

(c) transverse severing means (18, 19) operatively associated

with the suction drum for cutting the web into successive blanks,

(d) means (20–24) for applying a vacuum to an outer surface of the suction drum over a predetermined peripheral zone of travel thereof to positively retain the web and blanks thereon throughout said zone, and

(e) a blank conveyor (26) disposed between the suction drum and the packaging station, and comprising:

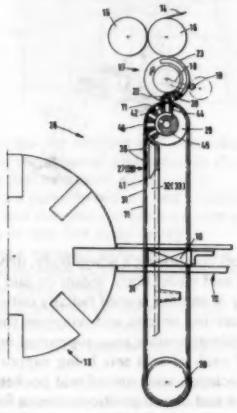
(1) a pair of transversely spaced, parallel, endless, commonly rotatably driven, perforated (36) belts (27, 28),

(2) respective upper and lower, parallel axes deflecting rollers (29, 30) mounting said belts, and

(3) suction means disposed behind the belts along a conveying run thereof for applying a vacuum thereto to positively but releasably retain the blanks thereon throughout said run,

(f) the suction drum being mounted such that a leading end portion of the peripheral zone thereof, in the direction of rotation, adjoins a trailing end portion of the conveying run of the belts to ensure the positive and continuous retention of the blanks without deformation during the transfer thereof from the drum to the belts, and

(g) the packaging station being disposed sufficiently downstream of a transfer zone between the drum and belts that trailing ends of severed blanks have left said transfer zone before central portions of said blanks arrive at said packaging station.



4,495,747

METHOD AND APPARATUS FOR AUTOMATICALLY PREPARING FLEXIBLE, DISPOSABLE PACKING CONTAINERS

Koichi Shimofuri, Kyoto, Japan, assignor to Todo Seisakusho Ltd., Japan

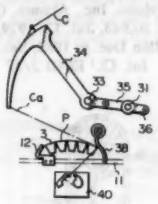
Filed Jan. 18, 1982, Ser. No. 340,354

Int. Cl.³ B65B *61//18*

U.S. Cl. 53—412 **12 Claims**

1. A method for providing a flexible container of the type which includes a receptacle section and a cover section connected to one another by a substantially straight elongated joint with an opener cord surrounding said joint, said method comprising the steps of:

bending said flexible container along said joint in such a manner that said joint is bent into an arc as viewed in a plane which passes through the entire length of said joint;



placing an opener cord around said joint while it is bent into said arc, the length of said cord being approximately twice the length of said joint; and, thereafter,

permitting said container to assume its original shape.

4,495,748

CONTAINERS AND MACHINE FOR MAKING THEM

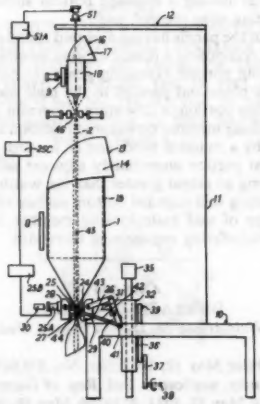
Frank J. Rowell, Fishponds Farm, Brook, Near Ashford, Kent, England

Filed Oct. 8, 1981, Ser. No. 309,746

Claims priority, application United Kingdom, Oct. 14, 1980, 8033091; Jul. 31, 1981, 8123457

Int. Cl.³ B65B *9/12, 3/16, 3/17*

U.S. Cl. 53—449 **8 Claims**



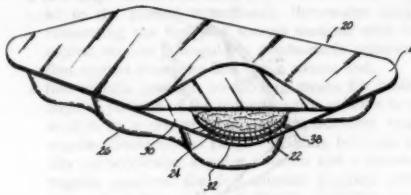
1. A method of making containers comprising forming a first sheet of liquid-impervious material into a first tube for successive bags, forming a second such sheet into a smaller diameter second tube for making successive tubular valve members, feeding contents into the first tube at successive intervals, locating the second tube in the first tube, providing first and second seals between successive tops and bottoms of successive containers and separating successive containers from each other, forming third seals (3A or 5) partly across each of the second tubes between the upper and lower ends of the containers, making said first and second seals (4,6A) as seals across the tubes, said first and second seals being in pairs closely adjacent to one another and parallel to each other, one of said pairs of seals making the top of one container, making openings (4) through the seals forming the tops of the containers by means of a rod inserted through these seals, while the second seal makes the bottom of the preceding container.

4,495,749

FOOD TRAY AND PACKAGING PROCESS

Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 182,855, Sep. 2, 1980, Pat. No. 4,355,755.
This application Jun. 21, 1982, Ser. No. 390,214
Int. Cl.³ B65B 7/28, 47/04, 51/22
U.S. Cl. 53—471 5 Claims



1. A method for forming a paperboard tray from a paperboard blank, said method comprising the steps of:

(a) deep drawing said blank to form a tray having a bottom wall, a continuous upstanding side wall having a plurality of corners, and a flange extending outwardly from a top edge of said side wall throughout the entirety of said side wall;

(b) forming a series of alternating ridges and depressions during said deep drawing step, which ridges and depressions extend across said flange at each of said corners from outer edges of said flange toward said corners of said side wall; and

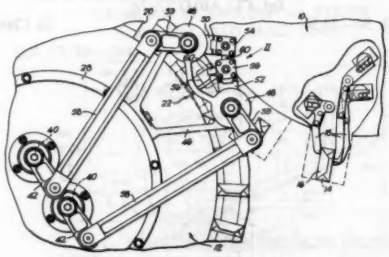
(c) forming a curvilinear trough in the upper surface of said flange and only in each of said corners which trough extends across all of said ridges and depressions in each corner, and opening at least one end of said trough through said side wall.

4,495,750

TRANSFERRING PACKETS

Austin L. Fox, London, England, assignor to Molins PLC, London, England

Filed Mar. 22, 1982, Ser. No. 360,522
Int. Cl.³ B65B 19/24
U.S. Cl. 53—575 6 Claims



1. Apparatus for transferring packets, such as soft packs of cigarettes, each said packet having at least one folded end, comprising:

(a) means defining a plurality of adjacent pockets, each of which is open at its axial ends and at one side;

(b) a pusher for transferring each successive packet axially into a pocket through one of said open ends with said at least one folded end of the packet leading;

(c) a pair of restraining devices operable alternately in different pockets to engage said at least one folded end of each of said successive packets;

(d) means mounting each of said restraining devices for movement in a direction transverse to the axis of said pockets and for movement in a direction axially of said pockets; and

(e) control means to alternately move each of said restraining devices in said transverse direction into alternate of said pockets through said one side thereof and for moving said devices axially in said pockets;

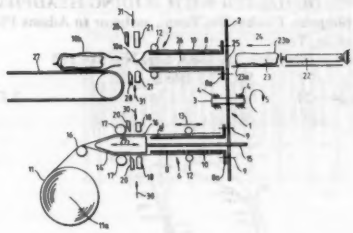
(f) whereby as said pusher transfers each successive packet through one of said open ends of a pocket said at least one folded end of said packet engages one of said restraining devices which is thereby caused to pass axially through said pocket while restraining said folded end during transfer thereof.

4,495,751

APPARATUS AND METHOD FOR PACKAGING ARTICLES IN A FLEXIBLE WRAPPING MATERIAL

Ambrogio Galbiati, Milan, Italy, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Nov. 2, 1981, Ser. No. 317,692
Claims priority, application United Kingdom, Nov. 11, 1980, 8036189
Int. Cl.³ B65B 43/42
U.S. Cl. 53—576 22 Claims



1. A process for packaging an article in a wrapper comprising the steps of:

loading a portion of a flat-folded tubular film wrapper stock material onto an external periphery of a hollow tubular mandrel at a stock-receiving station by advancing the flat-folded tubular film wrapper stock material about a guide bullet means adapted to open said flat-folded tubular film wrapper stock material and guide said material onto said external periphery;

severing said loaded portion of said tubular film wrapper stock material from the remainder of said material;

moving the hollow tubular mandrel and said loaded portion of tubular film wrapper stock material from the stock-receiving station to a stock-dispensing station;

dispensing the tubular film wrapper stock material from the external periphery of the hollow mandrel at said stock-dispensing station to form a wrapper;

advancing an article passed through an interior of the hollow tubular mandrel into said wrapper; and

moving the hollow tubular mandrel from the stock-dispensing station to the stock-receiving station.

2. A process for packaging articles in flexible wrappers, comprising the steps of:

providing a rotatable turret having at least two apertures and at least two hollow mandrels secured thereto wherein each hollow mandrel is communicatively aligned with one of said apertures and whereby the turret is adapted to rotatively index said mandrels from a tubular film stock-receiving station to a tubular film stock-dispensing station;

providing a supply of flat-folded tubular film wrapper stock material at the stock-receiving station;

advancing the tubular film wrapper stock material about a guide bullet means adapted to open said flat-folded tubular film wrapper stock material and guide said material onto an external periphery of a hollow mandrel at said stock-receiving station to build-up tubular film wrapper stock material on the external periphery of said hollow mandrel;

severing the tubular film wrapper stock material on said external surface from the supply of tubular film wrapper stock material at the stock-receiving station;

closing a severed end of the build-up of tubular film wrapper stock material at the stock-receiving station;

rotating the turret to index the hollow mandrel and the tubular film wrapper stock material on the external surface thereof from said stock-receiving station to said stock-dispensing station; and

dispensing said tubular film wrapper stock material from the external periphery of the hollow mandrel at the stock-dispensing station;

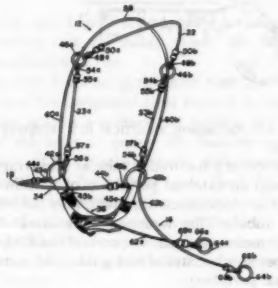
advancing articles through an aperture in said turret and through an interior of the hollow mandrel at the stock-dispensing station whereby the articles are inserted within said tubular film wrapper stock material.

4,495,752

CONTROL HALTER WITH SLIDING HEADPIECE

Roy G. Simpson, Cookeville, Tenn., assignor to Adams Plastics, Cookeville, Tenn.

Filed Jul. 15, 1983, Ser. No. 514,163
Int. Cl.³ B68B *1/02*
U.S. Cl. 54—24 **7 Claims**



1. A control halter for use in conjunction with a tie-down to develop and maintain a desired head set in a riding horse, comprising:

a nosepiece for being disposed about the nose of the horse;

a crownpiece for passing over the poll of the horse;

two cheek-pieces for being disposed on either side of the horse's head, said cheek-pieces being attached to and connecting between said nosepiece and said crownpiece;

a sliding headpiece having a midsection, having two downwardly extending sections for extending along the sides of the horse's head, and two ends for attachment to the tie-down; and

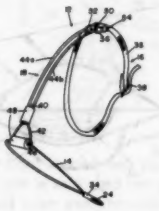
means for slidably holding said downwardly extending sections of said sliding headpiece adjacent to the interconnection of said crownpiece and said cheek-pieces and adjacent to said nosepiece, whereby, said midsection of said sliding headpiece is selectively movable into a position for extending over the poll of the horse and into a position for extending over the brown of the horse.

4,495,753

CONTROL HALTER

Roy G. Simpson, Cookeville, Tenn., assignor to Adams Plastics, Inc., Cookeville, Tenn.

Filed Jul. 15, 1983, Ser. No. 514,164
Int. Cl.³ B68B *1/02*
U.S. Cl. 54—24 **10 Claims**



1. A control halter for use in conjunction with a tie-down to develop and maintain a desired head set in a riding horse, comprising:

a loose-fitting nosepiece for loosely encircling the nose of the horse and disposed high on the nose of the horse and having upper and lower portions;

means for connecting the tie-down to said nosepiece;

a keeper strap for being disposed about the horse's head and neck, said keeper strap being dimensioned to extend over the poll and under the throttle of the horse; and

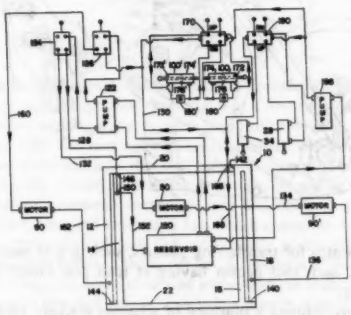
two substantially parallel connecting pieces extending between the top of said nosepiece and the top of said keeper strap, each of said connecting pieces being operable to extend along the horse's face and along the inside of one of the horse's ears whereby, said connecting pieces apply the same amount of pressure to the horse's head over the ears and to the nose when the horse raises its head or moves its head forward and the tie-down pulls on said nosepiece, said nosepiece being connected at its upper and lower portions to only said tie-down and said connecting pieces.

4,495,754

TRAILING WING MOWER WITH HYDRAULIC BREAKAWAY SYSTEM

Jack O. Cartner, 1005 N. Eighth, Cambridge, Ohio 43725

Continuation-in-part of Ser. No. 377,347, May 12, 1982, Pat. No. 4,442,658. This application Dec. 8, 1982, Ser. No. 447,789
Int. Cl.³ A01D *35/28*
U.S. Cl. 56—11.9 **18 Claims**



1. A trailing wing mower comprising:

a first mower section including supporting means for movably supporting the first section above and substantially parallel to the ground immediately thereunder and a first

motor means operatively connected with the first section for providing motive power to a first cutting means;

a second mower section including support means for movably supporting the section above the ground and means operatively connected with the second section for providing motive power to a second cutting means;

a first hinge means extending above and substantially parallel to the ground immediately thereunder operatively connecting the first and second sections such that the second section is angularly displaceable relative to the first section about the first hinge means; and,

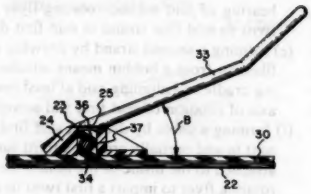
a first angular position controlling means for limiting the angular position of the second section relative to the first section to a selected angular displacement range, the angular displacement range extending between a generally perpendicular angular position and a selected limit angular position, the first angular position controlling means including a first hydraulic cylinder operatively connected between the first and second sections, hydraulic fluid supply means for selectively supplying hydraulic fluid to the first hydraulic cylinder to control the relative extension of the first hydraulic cylinder, and first hydraulic pressure relief means for relieving hydraulic fluid pressure a preselected force such that the relative extension of the first hydraulic cylinder is altered, the first hydraulic cylinder and the hydraulic fluid supply means select the limit angular position, such that the first hydraulic cylinder is adapted for selectively fixing the second section cantilevered over the ground when the ground thereunder is lower than the ground under the first section by an angle outside of the angular displacement range, and the first hydraulic pressure relief means allows the extension of the first hydraulic cylinder to be altered to permit the first and second sections to be angularly displaced between the perpendicular and limit angular positions as the sections follow the contour of the ground thereunder, such that the first section remains substantially parallel to the ground thereunder, whereby the first hinge and a portion of the first section thereadjacent are not lifted further above the ground and out of the parallel relationship therewith by the second section when the ground under the second section is higher than the ground under the first section.

4,495,755

CONVEYOR FOR A COMBINE HARVESTER

David W. Johnson, Bennet, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 19, 1983, Ser. No. 515,338
Int. Cl.³ A01D *43/02, 89/00*
U.S. Cl. 56—364 **13 Claims**



12. A flexible endless conveyor for a harvester pickup apron comprising in combination:

at least one elastomeric belt having a longitudinal direction and a transverse direction and an integral, unitary, elastomeric base with a plurality of integrally molded elastomeric cleats raised from the base and oriented in a plurality of transverse rows across the belt with transversely adjacent cleats interrupted by a space exceeding one-half the transverse dimension of said cleats, each of said cleats having a cleat bore therethrough with an axis parallel to the base, said cleat bores being aligned substantially perpendicular to the longitudinal direction of the belt;

a plurality of tine bodies mounted on said belt to abuttingly rest on the base, each tine body having a tine mounting bore therethrough with an axis substantially parallel to the base of the belt such that the tine mounting bore substantially aligns with said cleat bore when said tine bodies are mounted on said belt, said tine bodies having at least one flexible tine extending therefrom;

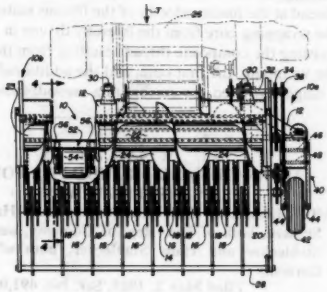
a means for detachably attaching said tine bodies to said belt through said tine mounting bore and at least one of said cleat bores.

4,495,756

PICKUP ATTACHMENT FOR HARVESTING MACHINES

James G. Greiner, Leola, and Edward H. Priepke, Lancaster, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Aug. 15, 1983, Ser. No. 523,476
Int. Cl.³ A01D *89/00*
U.S. Cl. 56—364 **13 Claims**



1. In a pickup attachment for use on crop harvesting machines, said pickup attachment having a frame, a reel supported on said frame, said reel including fingers connected to and rotatable about a shaft in a predetermined path to engage and pick up crop material on the ground, the improvement comprising:

a wheel connected to said frame for supporting one side of said pickup attachment, said wheel being positioned so that its center is located substantially in alignment vertically with the axis of said shaft;

a roller connected to said frame and located underneath said pickup attachment for supporting the other side of said pickup attachment, said roller being positioned so that its center is located rearward of the axis of said shaft and rearward of the center of said wheel; and

said one side of said pickup attachment being supported solely by said wheel and said other side of said pickup attachment being supported solely by said roller to allow said predetermined path of said reel fingers to follow the contour of the ground in proximity thereto.

4,495,757

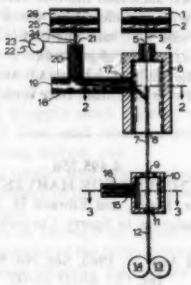
METHOD OF AND APPARATUS FOR MANUFACTURING YARN WITH A CORE

Milko D. Dimitrov, Sofia, Bulgaria, assignor to N P S P "Novotex", Sofia, Bulgaria

Filed Feb. 15, 1983, Ser. No. 466,647
Claims priority, application Bulgaria, Feb. 15, 1982, 55375
Int. Cl.³ D02G *3/36, 3/34*
U.S. Cl. 57—5 **14 Claims**

1. A method for manufacturing yarn with a core, comprising feeding a first core made of fibrous material by a pair of feeding

rollers, passing the first core through a first jet of gas, driving fibers laterally into said first jet by a tangential gas current to form a wrapping about the first core, at the time of passing the fibers through the first gas jet for the formation of wrapping upon the first core imparting a false twisting to the composite material made up of the first core and the wrapping simultaneously with the lateral driving in of fibers by a tangential air current in the first jet leading in a second additional core thread at the linear velocity of the fibrous material for forming the wrapping core from the laterally driven in fibers, and false twisting the composite thread resulting from the confluence of the wrapping, the first core, and the additional core thread by a tangentially fed gas current in a second, subsequent, gas jet.



4,495,758

APPARATUS AND METHOD FOR FORMING A WRAPPED YARN

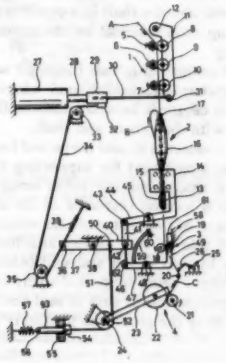
Fritz Stahlecker, Bad Ueberkingen, and Hans Braxmeier, Suessen, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,021

Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216749

Int. Cl.³ D01H *13/22, 13/16*

U.S. Cl. 57—19 **25 Claims**



1. A yarn forming apparatus adapted to form a wrapped yarn composed of a core strand having a binder strand spirally wrapped thereabout, and comprising

means for advancing a core strand along a path of travel and to a rotating take-up package,

means for withdrawing a binder strand from a supply package and spirally wrapping the same about the advancing core strand to form a wrapped yarn,

monitoring means for detecting a break in at least the core strand, and

control means responsive to said monitoring means detecting a break in the core strand for terminating the advance of the core strand and including means for positively terminating the withdrawal of the binder strand from its supply package, so as to avoid undue winding of the binder strand on the take-up package.

4,495,759

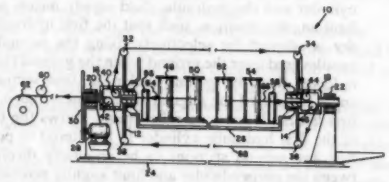
MANUFACTURE OF METALLIC CABLE

Dennis R. Brandyberry, Canton, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 5, 1983, Ser. No. 539,191

Int. Cl.³ D07B *3/12*

U.S. Cl. 57—58.52 **3 Claims**



1. A method of manufacturing a metallic cable comprising the steps of:

(a) forming a first strand by drawing a plurality of metallic filaments from a plurality of bobbin means attached to a non-rotating cradle of a cable making machine and aligning said plurality of filaments along the axis of rotation of first and second coaxial rotating flyers of said cable making machine;

(b) drawing said first strand next to and partially around a first sunken rotating pulley attached to the inside of a hollow bearing of said first rotating flyer to impart a first twist to the filaments of said first strand in a first direction;

(c) drawing said first strand past said first and second rotating flyers;

(d) drawing said first strand next to and partially around a second rotating pulley attached to the inside of a hollow bearing of said second rotating flyer to impart a second twist to said first strand in said first direction;

(e) forming a second strand by drawing at least one metallic filament from a bobbin means attached to said non-rotating cradle and aligning said at least one filament along the axis of rotation of said first and second flyers;

(f) forming a cable by drawing said first and second strands next to and partially around a third sunken rotating pulley attached to the inside of the hollow bearing of said second rotating flyer to impart a first twist to said first and second strands in a second direction and partially untwist the filaments of said first strand;

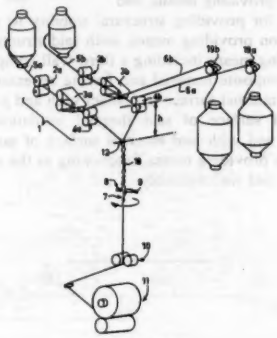
(g) drawing said cable past said second and first rotating flyers; and

(h) drawing said cable next to and partially around a fourth sunken rotating pulley attached to the inside of the hollow bearing of said first rotating flyer to impart a second twist to said strands in said second direction and completely untwist the filaments of said first strand.

4,495,760
PROCESS AND APPARATUS FOR SPINNING CORED FILAMENTS, AND CORED FILAMENTS THUS OBTAINED

Michel E. A. Vanhelle, 33, promenade Michel Simon, 93160 Noisy Le Grand, France

Filed Jun. 7, 1982, Ser. No. 385,676
Claims priority, application France, Jun. 12, 1981, 81 11642
Int. Cl.³ D02G 3/38
U.S. Cl. 57—211 18 Claims



1. A process for spinning a cored filament comprising the steps of

drawing at least one fiber sheath between a point of introduction of the sheath and a pair of drawing cylinders, introducing at least one continuous filament upstream of said drawing cylinders to form at least two strands, twisting a strand comprising at least a fiber sheath with at least one other strand comprising at least a continuous filament,

introducing the strands at a single convergence point upstream of a winding mechanism;

regulating the tension of the strands,

winding the strands to form a filament, and

retwisting the filament thus formed.

4,495,761
MULTICOLORED YARN AND METHOD

Takashi Nakayama; Kohji Kajita, and Selichi Yamagata, all of Shiga, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 238,566, Feb. 26, 1981, Pat. No. 4,383,403, which is a continuation of Ser. No. 56,391, Jul. 10, 1979, abandoned. This application Feb. 7, 1983, Ser. No. 464,655
Claims priority, application Japan, Oct. 7, 1978, 53-82972
Int. Cl.³ D02G 3/00; D01H 13/00
U.S. Cl. 57—328 12 Claims

1. A method of manufacturing a multicolored yarn comprising:

(a) feeding two or more kinds of sliver differing from each other in color tone or in dyeability and arranging them substantially parallel to each other;

(b) continuously drafting said slivers;

(c) feeding the drafted slivers through nip rollers;

(d) false twisting a core portion of the slivers to produce a false twisted bundle of staple fibers while leaving untwisted a plurality of outside staple fibers which are not twisted into said false twisted bundle of staple fibers;

(e) shifting said core portion back and forth in a sidewise direction;

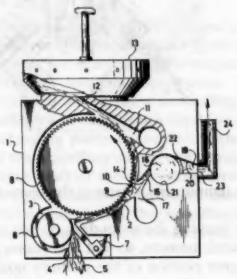
(f) integrating the false twisted bundle of staple fibers and the free outside staple fibers into a whole; and

(g) detwisting the integrated bundle to produce a substantially detwisted core and a plurality of said outside fibers wrapped substantially helically about said core to produce a multicolored yarn.

4,495,762
APPARATUS FOR SEPARATING FIBERS IN OPEN-END SPINNING UNITS

Jan Junek, Dukla; Václav Vorborník, Komenskeho Letohrad; Josef Ripka, Tvardkova; Frantisek Jaros, Dukla; Ludmila Lihtarová, Dukla; Frantisek Hortlík, Dukla; Zdenek Kotrba, Tvardkova; Bozena Rehácková, and Ladislav Dvorák, both of Polska, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Feb. 23, 1983, Ser. No. 468,887
Claims priority, application Czechoslovakia, Mar. 4, 1982, 1465-82
Int. Cl.³ D01H 7/888
U.S. Cl. 57—411 4 Claims



1. In an apparatus for separating fibers in open-end spinning units, said apparatus having a fiber separating cylinder in a cavity of a housing in which on a cylindrical surface there is provided a cleaning aperture with an impurity separating duct which latter opens by its impurity rebounding wall into a cylindrical impurity collecting chamber communicating, on the one hand, with an air supply aperture and, on the other hand, with an impurity sucking-off duct having a first and a second wall, the improvement wherein the first wall of the sucking-off duct tangentially merges into the cylindrical wall of the cylindrical impurity collecting chamber downstream of the outlet of the impurity separating duct and is oriented in the direction of rotation of an air vortex in said cylindrical collecting chamber toward an impurity ejecting duct the axial height of said sucking-off duct in the region of joining said collecting chamber is the same as or larger than the axial height of the outlet from said impurity separating duct into said collecting chamber.

4,495,763
DUAL-THRUST NOZZLE APPARATUS FOR ROCKETS

Dell A. Johnson, Nibley, and Christopher W. Boileau, Brigham City, both of Utah, assignors to Thiokol Corporation, Chicago, Ill.

Filed Mar. 21, 1983, Ser. No. 476,956
Int. Cl.³ F02K 1/18
U.S. Cl. 60—242 20 Claims

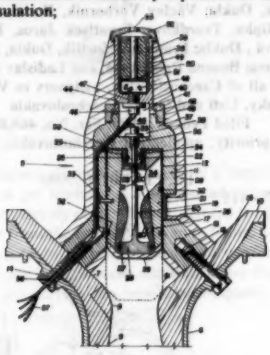
1. Apparatus for imparting dual-thrust capability to a convergent-divergent primary thrust nozzle for rockets, having a throat, comprising:

a housing having a cavity therein;

means for mounting the housing upstream of said nozzle throat, so that the cavity opens to the aft of the housing, and so that the housing is spaced away from the convergent portion of the primary nozzle to avoid obstructing propulsive gases that must pass through the nozzle;

a coat of thermal insulation covering and encasing the housing and the means for mounting the housing for the protection thereof from the high temperatures and erosiveness of the propulsive gases;

a secondary convergent-divergent nozzle member installed for aftward movement in the cavity of the housing and having a throat that is smaller in diameter than that of said primary nozzle, the aft end of the secondary nozzle member being sealed and covered by a portion of the coat of thermal insulation;



means for temporarily retaining the secondary nozzle in said cavity;

means for moving the secondary nozzle member aftwardly at a desired moment, so that it becomes seated against the convergent portion of the primary nozzle in axial alignment therewith; and

means for automatically opening the secondary nozzle member to propulsive gases of the rocket and for opening the aft end of the secondary nozzle member and for removing therefrom the said portion of the coat of thermal insulation when the secondary nozzle member is seated against the convergent portion of the primary nozzle for discharge of the propulsive gases through the secondary nozzle.

4,495,764

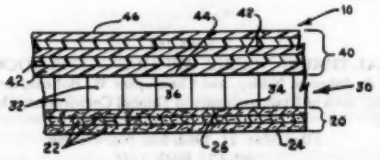
INTEGRATED INSULATION WALL ASSEMBLY

Clayton C. Gnagy, Enumclaw, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1983, Ser. No. 498,335

Int. Cl.³ F02K 9/34

U.S. Cl. 60—255 **12 Claims**



1. An integrated insulation wall assembly, comprising:

a. means for providing a fire barrier for said wall assembly, with this means including a first wall component made of ablative composite material bonded by ablative matrix material and having an external surface, and an internal surface which functions as the internal surface of said wall assembly;

b. means for providing thermal insulation for said wall assembly, with this means including a second wall component made of non-metallic honeycomb core material and having an external surface, and an internal surface in contact with and joined to said external surface of said fire barrier providing means; and

c. means for providing structural stability to said thermal insulation providing means, with said structural stability providing means including a third wall component made of a composite material and having an external surface, and an internal surface in contact with and joined to said external surface of said thermal insulation providing means, and with said external surface of said structural stability providing means functioning as the external surface of said wall assembly.

4,495,765

WAVE-ENERGY CONVERTER

Michael J. French, United Kingdom Atomic Energy Authority, 11 Charles II St., London, SW1Y 4QP, England

Division of Ser. No. 361,973, Mar. 25, 1982, abandoned, which is a continuation of Ser. No. 94,855, Nov. 16, 1979, Pat. No. 4,341,074. This application Nov. 1, 1983, Ser. No. 547,645

Claims priority, application United Kingdom, Feb. 9, 1979, 7904658

Int. Cl.³ F03B 13/12

U.S. Cl. 60—398 **7 Claims**

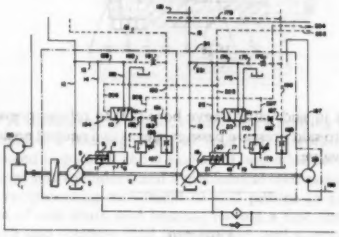
1. A device for converting the energy of waves on a liquid into useful work, the device comprising a plurality of bodies each being just buoyant in the liquid, a plurality of tubular elongate tie members arranged to be disposed between the bodies in substantially horizontal directions in the liquid to form a net-like arrangement with a respective body connected at each of the notional intersections of the elongate members for reciprocating horizontal motion relative to adjacent bodies, the bodies being spaced apart so that waves cause reciprocating horizontal displacement of the bodies relative to one another, each elongate member defining a bore therein adapted to contain a fluid and comprising an elastomeric material reinforced with layers of helically wound relatively inelastic filaments, such that application of an axial tensioning load on the elongate member causes a reduction in volume of the bore and thereby discharge of the fluid from the bore, adjacent layers of the filaments having the filaments thereof wound in opposite relationship, inlet valve means and outlet valve means connected to the bore, and means for performing useful work from discharge of the fluid from the bore through the outlet valve means, the arrangement being such that reciprocating horizontal relative motion of the bodies in response to waves causes corresponding changes in elongation of the elongate members and thereby discharge of the fluid to the work performing means.

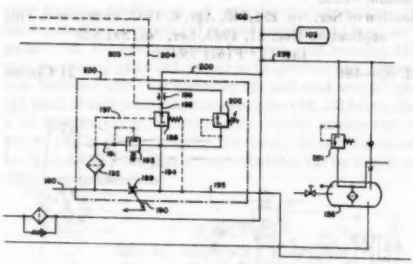
4,495,766

CONTROLS FOR HYDROSTATIC SYSTEMS

Alfred Krusche, Johannesberg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 325,032
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044143
Int. Cl.³ F16D 33/00, 33/02
U.S. Cl. 60—428 8 Claims





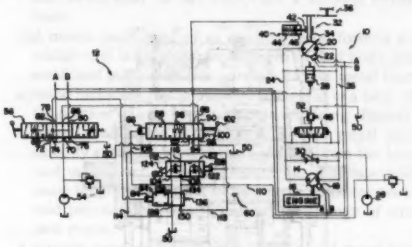
1. In a control for a hydrostatic drive system with a primary energy source and with at least two adjustable pumps driven by a common power source and at least one adjustable consumer of hydrostatic energy and with a pump adjusting piston connected with the adjusting element of each of the at least two pumps and capable of sliding in a pump adjustment cylinder, where the load on the pump adjustment cylinder of each of the at least two pumps is regulated by means of a separate servo control valve, and a constant pump connected to and driven by the power source in common with said at least two adjustable pumps; a delivery line connected to and receiving fluid from said constant pump, a restrictor in said delivery line, a signal-pressure line connected to the delivery line in front of the restrictor, a control-signal line connected to each servo control valve, a relief valve jet in said control-signal line and connected to and regulated by said signal pressure line, the improvement characterized in that the control-signal line is bifurcated between the relief valve jet and each servo control valve and an additional restrictor is located in the bifurcated control-signal line to provide a pressure gradient and means are provided for operatively connecting the two sides of the bifurcated signal line to the separate servo control valves whereby to control the loading of the pump adjusted cylinder.

4,495,767

ANTICAVITATION CONTROL SYSTEM FOR A HYDROSTATIC TRANSMISSION

Teruo Akiyama, Yokohama, and Koichi Morita, Kamakura, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,533
Claims priority, application Japan, Nov. 30, 1981, 56-190911
Int. Cl.³ F16D 31/02
U.S. Cl. 60—436 4 Claims



1. In a hydrostatic transmission of the type including a hydraulic, bidirectional, variable-displacement drive pump having a first servo control for controlling the output thereof, a hydraulic, bidirectional, variable-displacement propelling motor having a second servo control for controlling the output thereof and and connected in circuit with the drive pump to be driven thereby, a charging pump connected to the circuit of the drive pump and the propelling motor, and a brake assembly provided to an output shaft of the propelling motor for normally locking same against rotation, the brake assembly being adapted to release the output shaft of the propelling motor only while being supplied with a hydraulic brake release, a control system comprising:

(a) a control pump;

(b) a speed control valve actuated manually for delivering servo control signals, derived from the control pump, to the first and second servo controls to cause same to control the outputs from the drive pump and the propelling motor;

(c) a brake control valve normally held in a first position for allowing the brake assembly to lock the output shaft of the propelling motor against rotation, the brake control valve being pilot actuated from the first to a second position for delivering the brake release signal, derived from the control pump, to the brake assembly, the brake control valve further providing a fluid connection from the speed control valve to a reservoir to prevent the speed control valve from putting out the servo control signals when the brake control valve is in the first position; and

(d) sensor valve means for allowing the output from the charging pump to pilot-actuate the brake control valve from the first to the second position only when the charging pump output pressure rises to a predetermined level and, at the same time, when the speed control valve is being actuated manually and for causing the brake control valve to return to the first position regardless of the position of the speed control valve when the charging pump output pressure falls below the predetermined level.

4,495,768

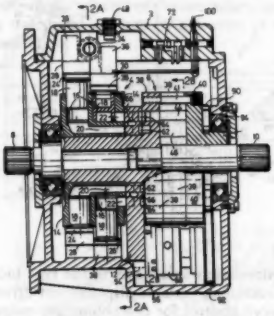
HYDROSTATIC TRANSMISSIONS

Viljo K. Valavaara, Milton, Canada, assignor to Inventors Compendium International Corp., Don Mills, Canada

Filed Mar. 12, 1982, Ser. No. 357,495
Int. Cl.³ F16D 31/06
U.S. Cl. 60—414 6 Claims

1. A hydraulic variable speed transmission comprising a

casing, an input shaft, an output shaft, a first hydrostatic pump-/motor unit within the casing having at least two similar reaction surfaces supported for coordinated non rotative eccentric movement in radial directions equiangularly spaced abot the unit axis, a second hydraulic pump/motor unit coaxial with the first unit within the casing and having means defining at least two similar equiangularly spaced reaction surfaces supported for rotation together about the axis of the unit, each unit having rotor equipped with radially movable displacement control members engaging the reaction surfaces of that unit and coupled to the input and output shafts respectively, the reaction surface defining means of the second unit being supported by a



rotatable member coupled to the input shaft, a stationary commutating valve member establishing two independent paths for fluid flow between the units whereby to coordinate the transfer of fluid in an internal circuit between the pump/motor units, and an external hydraulic circuit including at least one source of pressurized hydraulic fluid, said valve member including means establishing external connections between said independent paths and said external hydraulic circuit whereby pressurized fluid may be transferred bidirectionally between said internal circuit and said external circuit and whereby a difference in the fluid pressure in said two independent paths may be selectively responded to or maintained by said external circuit.

4,495,769

BOOSTER POWER STEERING

Werner Tischer, Böbingen; Karl-Heinz Liebert, Schwäbisch Gmünd, and Rolf Fassbender, Mutlangen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,632

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031230

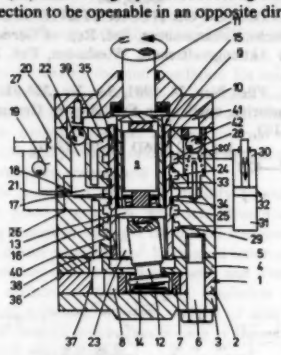
Int. Cl.³ F16D *31/02*

U.S. Cl. 60—451 **2 Claims**

1. A booster steering valve comprising a housing (5) with a valve sleeve (10) therein having an inner bore (23) and being actuatable relative to said housing responsive to operation of a manually operable steering shaft (11) wherein said housing and valve sleeve have coacting passages and grooves for controlling pressure and exhaust flow to and from the chambers of a servomotor including a servopump pressure groove (17) in said housing; further including a metering pump (1) actuated by operation of said steering shaft; said housing and valve sleeve having a neutral position wherein pressure flow from said servopump is bypassed to a tank from said pressure groove; and wherein said housing has a servopump pressure passage means (20, 21) with a back pressure valve (22) therein openable in one direction by pressure in said pressure passage means to the inlet of said metering pump via said valve sleeve bore;

the improvement comprising:

a passage means (20') having a connection from said pressure passage means to the downstream side of said back pressure valve (22) and having a pressure limiting valve (42) in said connection to be openable in an opposite direction by



pressure in said valve sleeve bore (23) to relieve pressure therein to said pressure passage means in a neutral position of said valve.

4,495,770

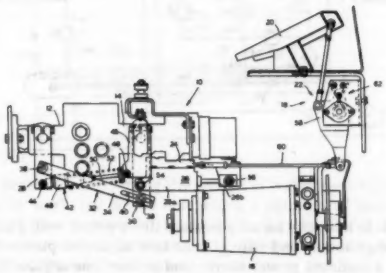
HYDROSTATIC CONTROL SYSTEM

Thomas M. Sagaser; Patrick Kuhn, and Knute K. Brock, all of Bismarck, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 251,440, Apr. 6, 1981, abandoned. This application Dec. 21, 1983, Ser. No. 541,828

Int. Cl.³ F16H *39/48*

U.S. Cl. 60—486 **21 Claims**



1. An improved hydrostatic control system for controlling the output of a hydrostatic drive unit for a vehicle, the drive unit comprising:

a pair of output pumps axially aligned, each of the output pumps having an infinitely variable swash plate operatively connected thereto to control the output of the respective pumps;

a drive motor;

cooperative means between the drive motor and the output pumps to couple the output pumps to the drive motor without intervening valves or other flow control devices;

operative means to control the output of the drive motor; and

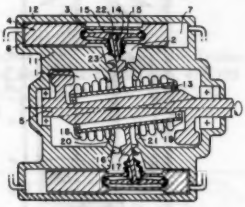
the improvement comprising a lost motion connecting means provided between the swash plates of the aligned drive pumps, such lost motion connecting means including a single operator control device to sequentially control the output of one or both pumps.

4,495,771

STIRLING-CYCLE ENGINE

Claude Chauveton, Chalabre, France, assignor to Creusot-Loire, Paris, France

Filed Apr. 11, 1983, Ser. No. 484,029
Claims priority, application France, Jun. 4, 1982, 82 09776
Int. Cl.³ F02G 1/00
U.S. Cl. 60—525 5 Claims



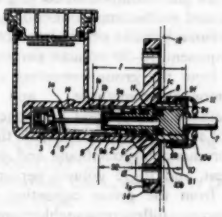
1. A stirling-cycle engine, comprising a housing in which are assembled a rotating shaft, at least three working cylinders arranged in parallel about said shaft, a double-acting piston in each of said cylinders, and a mechanical transmission converting reciprocating movement of said pistons to rotary movement of said shaft, said housing having a first chamber (1) in which said rotating shaft is assembled, and a second chamber (2) in which said mechanical transmission is assembled, said mechanical transmission consisting of an oscillating plate (13, 14) which is immobile against rotation and has an orbital movement and the axis of which describes a conical surface about said rotating shaft, and of articulated connections (15–22) linking each said piston (4) to said oscillating plate, an elastic gasket (18, 19) being located between said housing (11) and said oscillating plate (13, 14) so as to prevent any communication between said first chamber (1) and said second chamber (2), each of said articulated connections (15, 22) being placed in a receptacle (3) of a component rigidly connected to said piston (4), a third chamber contained in said receptacle (3) being isolated from said second chamber (2) by elastic gaskets (23).

4,495,772

BRAKE MASTER CYLINDER

Yohichi Furuta, Chiryu; Kaoru Tsubouchi, Toyota, and Kaoru Nanamura, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 263,723, May 14, 1981, abandoned.
This application Oct. 31, 1983, Ser. No. 547,447
Claims priority, application Japan, May 16, 1980, 55-67696[U]
Int. Cl.³ F15B 7/00
U.S. Cl. 60—533 2 Claims



1. A brake master cylinder having a push rod and a reservoir, comprising:

a body of resin material having an open and closed end and an inner cylindrical portion which includes a small diameter portion at said closed end, a large diameter portion at said open end and a middle diameter portion located between said large and small diameter portions;

a metal liner inserted within said body wherein said metal liner includes a through-hole formed therein which has substantially the same diameter as said small diameter portion of said body and wherein an outer diameter portion of the metal liner includes a small outer diameter portion which engages with said middle diameter portion of said body and a large diameter portion which engages with said large diameter portion of said body and wherein said metal liner further comprises a voidless cylindrical liner;

seal means positioned in an annular space formed by said middle and large diameter portions of said body and said small and large diameter portions of said metal liner;

a piston including piston cup means formed in a large diameter portion of said piston, said piston being slidably positioned within said through-hole of said metal liner and directly actuated by said push rod, wherein the length of said metal liner is slightly longer but of substantially the same length as a length of said large diameter portion of said piston plus a length defined by a range of stroke of said piston;

a support member for securely holding said metal liner and limiting movement of said push rod, said body further including a flange portion;

a dashboard member connected to said flange of said body wherein said support member includes at one end thereof an extension securely positioned between said flange portion of said body and said dashboard member and wherein said flange portion has a hole formed therein; and

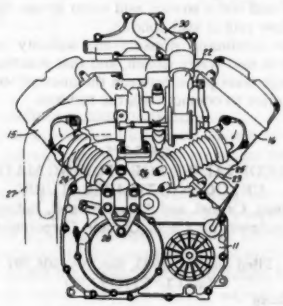
a metal collar member secured to said extension of said support member and securely positioned within said hole in said flange portion of said body and wherein said body includes an outlet port and a hole for communicating with said reservoir formed in said small diameter portion of said body and, said outlet port and said hole are open to said small diameter portion of said body.

4,495,773

TURBOCHARGER FOR MOTORCYCLES

Kazuo Inoue, Tokyo, and Kentaro Kato, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,144
Claims priority, application Japan, Sep. 17, 1980, 55-128014
Int. Cl.³ F02B 37/00
U.S. Cl. 60—605 6 Claims



1. A turbocharger system for a motorcycle having a multicylinder V-engine with a crankshaft, the engine being supported on a body frame between front and rear wheels with the centerline of the engine extending fore-and-aft of the motorcycle, the turbocharge system comprising

an exhaust manifold including a hollow support rigidly fixed to the engine and exhaust pipes connected to the engine cylinders and extending toward the axis of the crankshaft and converging to said hollow support; and

a turbocharger mounted to and positioned atop said hollow support adjacent one end of the V of the multicylinder V-engine and including an engine intake pipe extending toward the engine.

4,495,774

PROCESS FOR GENERATING ELECTRIC POWER BY MEANS OF TURBOGENERATORS USING HIGH PRESSURE VAPOR

Otto Domdey, Buchenstrasse 58, Ludwigshafen, Fed. Rep. of Germany

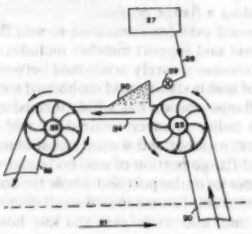
PCT No. PCT/EP80/00012, § 371 Date Nov. 6, 1980, § 102(e) Date Nov. 6, 1980, PCT Pub. No. WO80/01932, PCT Pub. Date Sep. 18, 1980

Continuation-in-part of Ser. No. 224,571, Nov. 6, 1980, Pat. No. 4,394,815. This PCT application Mar. 3, 1980, Ser. No. 484,918

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.³ F01K *25/06*

U.S. Cl. 60—649 **5 Claims**



1. An improvement in a process for generating electrical current by means of hydraulic turbogenerators, wherein a conduit connects a water reservoir with turbines of said turbogenerator, said conduit containing a water stream supplying motive power to said turbines, said water stream being subjected to common air pressure conditions at said reservoir, with a vapor generating chamber adjacent the water stream conduit at a point outside of the turbine space and in fluid communication with said water stream conduit, said improvement comprising:

inserting the high pressure vapor into said water stream conduit at said point outside of said turbine space into one side of said water stream, said water stream having a very high flow rate in said conduit,

such that continuous pressure and velocity increases are caused in said water stream, and that practically no heat exchange takes place between the inserted vapor and the water prior to contact with the turbines.

4,495,775

SHIPPING CONTAINER FOR STORING MATERIALS AT CRYOGENIC TEMPERATURES

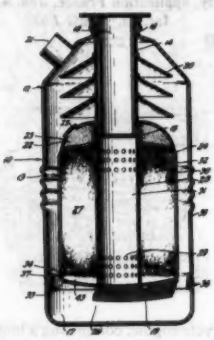
John K. Young, Carmel, and Alfred Barthel, Indianapolis, both of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 22, 1983, Ser. No. 506,791

Int. Cl.³ F17C *11/00*

U.S. Cl. 62—48 **14 Claims**

1. A shipping container for transporting materials at cryogenic temperatures having a micro-fibrous structure with randomly oriented fiber particles adapted for holding a liquefied gas such as liquid nitrogen in adsorption and capillary suspension within the interior of the container, said micro-fibrous structure comprising a core permeable to gaseous and/or to liquid nitrogen, with said core being disposed in said container and having at least one void adapted for the removable placement of the transportable materials; and a liquefied gas adsorption matrix composed of a mass of very small diameter substantially non-porous inorganic fibers in a range from 0.03 to 8 microns in diameter with the fibrous particles surrounding said core as a homogeneous body having an outside diameter conforming to the diameter of the shipping container.



4,495,776

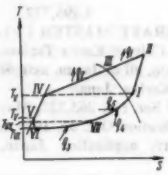
METHOD AND COOLING AGENT FOR FREEZING AND STORING PRODUCTS

Vladimir A. Nikolsky; Valery M. Yagodin, both of Kiev; Evgeny N. Vazhnov, Moscow; Efim S. Bondar, Kiev; Igor P. Naumenko, Kiev; Valery F. Vozay, Kiev; Vladimir N. Orlov, Kiev, and Vladimir I. Tikhonov, Kiev, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Experminetalno Konstruktorsky Institut Elektrohytovyky Machin I Priborov, U.S.S.R.

Filed Oct. 13, 1981, Ser. No. 311,059

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—114 **15 Claims**



1. A method of refrigeration, comprising the steps of

compressing a multi-component cooling agent to a working pressure, said multi-component cooling agent comprising 10–50 volume percent of difluorodichloromethane as a first component 10–50 volume percent of a compound selected from the group consisting of carbon dioxide, trifluoromonochloromethane and trifluoromonobromomethane as a second component, 10–50 volume percent of a compound selected from the group consisting of difluoromonochloromethane and propane as a third component, and 10–75 volume percent of a compound selected from the group consisting of difluoromonochloroethane, difluoromonochlorobromomethane and octafluorocyclobutane as a fourth component,

condensing the compressed cooling agent at said working pressure to liquify the cooling component of higher boiling point, said cooling component of lower boiling point dissolving in the liquified component of higher boiling

point, thus forming a liquified cooling agent of said cooling components at said working pressure,

throttling said cooling agent to a lower pressure, thereby cooling the same,

at least partially evaporating the thus-cooled cooling agent which is at said lower pressure, thereby effecting cooling, and

recycling the at least partially evaporated cooling agent to the compressing step.

4,495,777

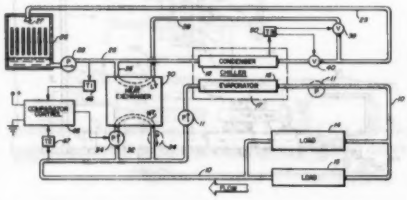
LOAD SHAVING SYSTEM

Thomas G. Babington, 913 S. Hohokam Dr., Tempe, Ariz. 85281

Filed Jan. 10, 1983, Ser. No. 456,703

Int. Cl.³ F25D *17/02*; B60H *1/00*

U.S. Cl. 62—185 **9 Claims**



1. A load shaving system for a closed loop fluid cooling system including in combination:

a closed loop fluid system for circulating working fluid through a load to remove heat from the load;

primary heat exchange means in said closed loop and having an input to receive said working fluid after passage thereof through the load to remove heat from said working fluid and having an output coupled to the load to deliver cooled fluid thereto;

secondary heat exchange means located between the load and said primary heat exchange means and having a shunt path interconnected with said closed loop working fluid system between said load and the input to said primary heat exchange means;

means for shunting at least some of said working fluid through said secondary heat exchange means;

means for providing a secondary source of cooling for working fluid shunted through said secondary heat exchange means;

first means for sensing the temperature of said working fluid after passage through the load and producing an output signal representative of such temperature;

second means for sensing a temperature proportional to the temperature of a cooling medium for said secondary heat exchange means and producing an output signal representative of such temperature; and

means for comparing the signals from said first and second temperature sensing means for producing an output signal coupled with said means for shunting working fluid to vary the proportion of working fluid shunted through said secondary heat exchange means.

4,495,778

TEMPERATURE AND PRESSURE ACTUATED CAPACITY CONTROL SYSTEM FOR AIR CONDITIONING SYSTEM

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Feb. 14, 1984, Ser. No. 580,047

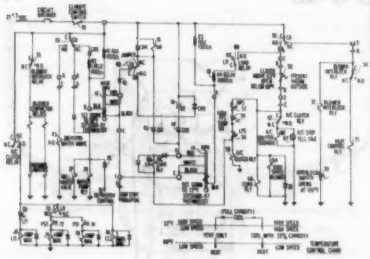
Int. Cl.³ F25B *1/00*

U.S. Cl. 62—209 **12 Claims**

1. A control apparatus for a climate control system for controlling the temperature of air in a controlled area, said system including a compressor operable at a plurality of different load levels and said system being capable of at least a cooling mode wherein said compressor is activated to reduce said air temperature, said control system comprising:

temperature sensing means for monitoring said air temperature;

further sensing means for sensing at least one operating parameter of said climate control system other than said air temperature; and



control means for varying the load level of said compressor above a first predetermined air temperature in accordance with said operating parameter, and for fixing the load level of said compressor at a predetermined load level below said first predetermined temperature regardless of the value of said sensed parameter.

4,495,779

AIR CONDITIONER

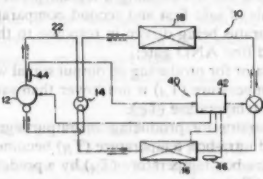
Tatsuo Tanaka; Hiroshi Itoh, and Akihiko Sugiyama, all of Fuji, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 15, 1984, Ser. No. 590,056

Claims priority, application Japan, Mar. 17, 1983, 58-44710

Int. Cl.³ F25B *41/00*

U.S. Cl. 62—211 **5 Claims**



1. An air conditioner comprising:

a refrigeration cycle circuit having a compressor of variable exhaust amount type, a first heat exchanger for condensing refrigerant, being connected to the compressor, a second heat exchanger for evaporating the refrigerant, being connected to the compressor, and a regulating valve capable of adjusting the opening degree thereof and connected between the first and second heat exchangers; and

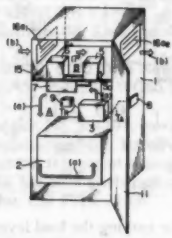
regulating means for regulating the refrigerant flow rate to the first or second heat exchanger by adjusting the opening degree of the regulating valve in response to the amount of the refrigerant exhausted from the compressor to set the exhaust temperature of the refrigerant from the compressor to a predetermined temperature responsive to the amount of the refrigerant exhausted from the compressor.

4,495,780

COOLING METHOD AND APPARATUS FOR HERMETIC TYPE CONTROL BOX

Tomonori Kaneko; Shunji Mori; Tetsuo Ichikawa, all of Hitachi; Yoichi Hiroki, Hitachiota, and Takashi Kariya, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,798
Claims priority, application Japan, Dec. 9, 1981, 56-196849
Int. Cl.[3] F25B *41/00*; H05K *7/20*
U.S. Cl. 62—229 6 Claims



1. An apparatus for cooling a hermetic type control box accommodating therein electronic apparatus with the aid of a cooling apparatus, comprising:

a cooling section of said cooling apparatus disposed at an upper portion of a hermetically closed portion of said control box;

an intra-box temperature detector for detecting an intra-box temperature (T_R) within said control box;

a first comparator for comparing said detected intra-box temperature (T_R) with a predetermined set temperature (T_C) to thereby produce an output signal when said intra-box temperature (T_R) is not lower than said predetermined set temperature (T_C),

an extra-box temperature detector for detecting an extra-box temperature (T_A) outside of said control box;

a second comparator comparing said detected extra-box temperature (T_A) with said predetermined set temperature (T_C) to produce an output signal when said extra-box temperature (T_A) is lower than said predetermined set temperature (T_C);

a first AND gate for determining a logical product of the output signals of said first and second comparators, said cooling apparatus being driven in response to the output signal of said first AND gate;

a third comparator for producing an output signal when said extra-box temperature (T_A) is not lower than said predetermined set temperature (T_C);

a fourth comparator for producing an output signal when said detected intra-box temperature (T_R) becomes higher than said extra-box temperature (T_A) by a predetermined temperature (T_D); and

a second AND gate for producing an output signal when the logical product of the output signals of said third and fourth comparators is valid, wherein said cooling apparatus is driven in response to the output signal of said second AND gate.

4,495,781

UNDERGROUND COOLING SYSTEM AND METHOD

Grafton G. Gatling, Rte. 1, P.O. Box 116A, Eure, N.C. 27935

Filed Feb. 17, 1983, Ser. No. 467,320
Int. Cl.[3] F25D *23/00*
U.S. Cl. 62—260 32 Claims

1. An underground cooling system using cooled air for cooling at least one building comprising:

(a) an air conveying means for conveying air underground including:

(i) an inlet for receiving air;

(ii) a blower for blowing air into said inlet;

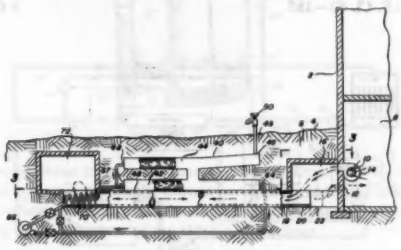
(iii) an outlet for emitting cooled air into said building;

(iv) an air line for transmitting air there-through, connecting said inlet to said outlet; and

(b) a container means for containing a liquid, including:

(i) an upper compartment;

(ii) a lower compartment, spaced apart from said upper compartment, at a different vertical height and in communication therewith so that when a liquid is in said container means said liquid may flow therebetween, wherein said container means is disposed at a depth beneath the ground such that when liquid is in said lower compartment, said liquid is at a lower temperature than air in said air conveying means, wherein said



air conveying means conveys air to a location where the air will become cooled by an exchange of heat with liquid from said lower compartment, a first liquid conveying means, attached at one end to said lower compartment and connected at its other end to said container means, for conveying liquid from said lower compartment therethrough, wherein a section of said first liquid conveying means is interposed in the path of air in said air line, said air line has first and second sections and said air conveying means further includes a junction chamber connecting said first and second sections wherein said junction chamber has a greater cross-sectional area than said air line and wherein at least a portion of said first liquid conveying means is interposed in said junction chamber.

4,495,782

TRANSMISSIVE DEWAR COOLING CHAMBER FOR OPTICALLY PUMPED SEMICONDUCTOR RING LASERS

Michael M. Salour, La Jolla, Calif., and Adrian Fuchs, Cham, Switzerland, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 16, 1983, Ser. No. 552,555
Int. Cl.[3] F25B *19/00*
U.S. Cl. 62—514 R 20 Claims

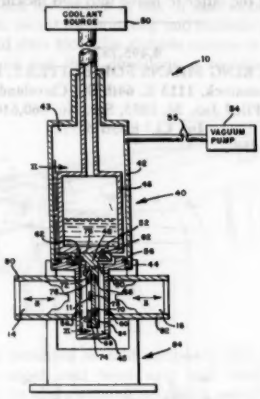
1. A transmissive Dewar cooling chamber comprising:

a housing, said housing having an upper chamber and a lower chamber, and said housing having walls made partially of material transmissive to a preselected wavelength, said transmissive material being situated juxtaposed said lower chamber in order to allow the passing of a beam of electromagnetic radiation of said preselected wavelength completely through said lower chamber of said housing;

means located within said lower chamber and extending into said upper chamber for supporting an object in said lower chamber, said object being optically aligned with said transmissive material so that said beam of electromagnetic radiation is capable of passing completely through said object;

means located in said upper chamber for providing a cooling

environment for said object, said object supporting means being operably secured to said cooling means; and



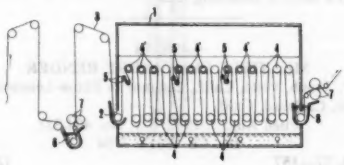
means operably secured to said housing for moving said housing and thereby said object in at least two dimensions.

4,495,783

APPARATUS FOR CONTINUOUS WET-HEAT TREATMENT OF CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Sep. 7, 1983, Ser. No. 530,125
Claims priority, application Japan, Sep. 16, 1982, 57-161399; Sep. 16, 1982, 57-161400; Sep. 16, 1982, 57-161401
Int. Cl.³ D06B *3/12, 23/20*
U.S. Cl. 68—5 D **3 Claims**



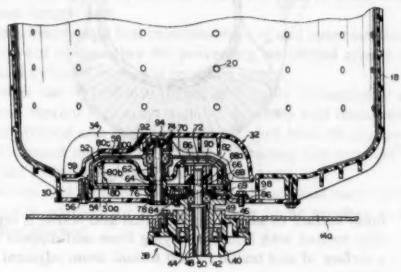
1. An apparatus for continuous wet-heat treatment of a cloth, comprising a non-tightly sealed wet-heat treating chamber provided with a plurality of liquid applying rollers for applying a treating liquid such as a treating liquid and/or water to a cloth running continuously through the wet-heat treating chamber, said liquid applying rollers being provided with numerous irregular, curved and bent communicating pores allover its periphery, and a high temperature liquid generating mechanism for generating a superheated treating liquid, said high temperature liquid generating mechanism being provided with a treating liquid heating pipe and/or a water heating pipe communicating to said liquid applying rollers.

4,495,784

WASHER-DEHYDRATOR HAVING A DRIVING GEAR SUPPORTED IN A SEALING CASE

Yoshio Ikeda, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 7, 1982, Ser. No. 386,083
Claims priority, application Japan, Jun. 8, 1981, 56-88491
Int. Cl.³ D06F *23/04*
U.S. Cl. 68—23.6 **14 Claims**



1. A washer-dehydrator which comprises:
a water tank;
a rotary tub rotatably disposed in the water tank;
a pulsator shaft rotatably attached to the inside of the rotary tub in an eccentric manner;
a pulsator coaxially fixed to the pulsator shaft;
a washing shaft coaxial with the rotary tub and having a projected end portion projecting into the rotary tub a given distance;
driving means for rotatably driving the washing shaft;
a driven gear coaxially fixed to the pulsator shaft;
a driving gear in mesh with the driven gear;
a sealing case housing the driven gear and the driving gear in a watertight manner, detachably fixed to the inside of the rotary tub, the sealing case having a penetrating hole to allow insertion of the projected end portion of the washing shaft, said driving gear having a cylindrical boss section fitted in the penetrating hole of the sealing case so as to be supported in the sealing case; and
engaging means for detachably engaging the projected end portion of the washing shaft with the driving gear to transmit the rotary force of the washing shaft to the driving gear in an engaged state.

4,495,785

APPARATUS FOR WET TREATMENT OF ENDLESS TEXTILE MATERIAL

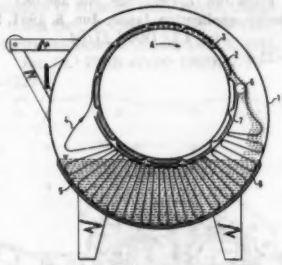
Gunter Eckrodt, Coesfeld, Fed. Rep. of Germany, assignor to Thies GmbH & Co., Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,953
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220990
Int. Cl.³ D06B *1/04, 3/16, 23/04*
U.S. Cl. 68—62 **12 Claims**

1. An apparatus for wet-treating an endless segment of textile material, comprising:
a closed, generally cylindrical container;
a drum rotatably mounted about the longitudinal axis thereof in said container with a bottom of said drum spaced from a bottom of said container;
a plurality of dippers carried by said drum, each of said dippers having a tangentially directed opening facing in the direction of drum rotation such that liquid therein empties from each dipper as each dipper passes an apogee of drum rotation;
means for filling said dippers with treatment liquid as said

dippers rotate with said drum through a lowest point thereof; and

means for conveying an endless segment of textile over an



outer surface of said drum such that said textile is repeatedly treated with liquid emptying from said dippers onto a surface of said textile closest to said drum adjacent said apogee.

4,495,786

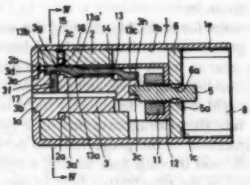
STEERING LOCK FOR AUTOMOTIVE VEHICLES

Mikio Masaki; Etuo Nara; Keiichi Shimizu, all of Tokyo, and Takeshi Fukasawa, Yokohama, all of Japan, assignors to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,865

Int. Cl.³ E05B *17/04*; B60R *25/02*

U.S. Cl. 70—186 **5 Claims**



1. A steering lock for an automobile having a steering shaft, comprising:

a frame;

a key cylinder rotatably mounted in said frame and having at one end thereof a cam, a locking step, and a radial slot, said key cylinder including a key insertion slot;

a check lever mounted axially movable on said key cylinder and having one end engageable with said cam or said locking step;

a locking rod movably supported in said frame and movable between a retracted position in which the locking rod is held out of locking engagement with the steering shaft and a locking position in which the locking rod is held in locking engagement with the steering shaft, said check lever having the other end engageable with said locking rod to keep the latter in said retracted position;

a first spring for normally urging said check lever to move in a direction to disengage the latter from said locking rod;

a central member slidably disposed in said radial slot;

said check lever being axially movable in a first direction in response to rotation of said key cylinder with a key inserted in said key insertion slot for causing said cam to displace said one end of the check lever toward said locking step until said other end engages said locking rod to keep the latter in said retracted position; and

said check lever being axially movable in a second direction opposite to said first direction in response to removal of the key out of said key insertion slot for returning said one end toward said cam while depressing said control member into said key insertion slot, whereby said other end of the check lever can be disengaged from said locking rod to allow the latter to move into said locking position.

4,495,787

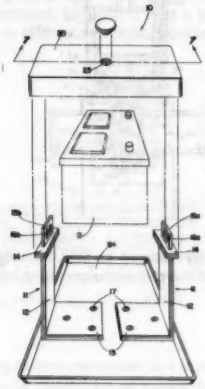
LOCKING MEANS FOR BATTERY, ETC.

Harold N. Comstock, 1113 E. 64th St., Cleveland, Ohio 44103

Filed Jan. 24, 1983, Ser. No. 460,610

Int. Cl.³ E05B *65/12*

U.S. Cl. 70—258 **7 Claims**



1. A tamper resistant lock for attachment to a battery comprising in combination a frame structure including a pair of pedestals secured to spaced opposite ends of a battery tray on which the battery rests, a lock box having a solid cover portion and a recessed bolt containing bottom portion adapted to be mounted on said pedestals, said bottom portion being provided with spaced openings on opposite sides of the bottom thereof through which vertical upwardly extending portions of the pedestals project, each of said vertical legs being provided with an elongated slot adjacent its upper projecting end, a pair of flat bolts slidably secured in the recessed portion of the bottom portion on opposite sides thereof, a key actuated lock recessed in the cover having a locking bar adapted to be rotated by the key lock to slide each of said bolts in the recessed portion of the cover through said each of said elongated slots to form a battery enclosing lock.

4,495,788

MULTIPLE CURVATURE BENDER

Zeno P. Traub, Vista, Calif., assignor to Eaton-Leonard Corporation, Carlsbad, Calif.

Filed Aug. 2, 1982, Ser. No. 404,531

Int. Cl.³ B21D *7/04*

U.S. Cl. 72—157 **12 Claims**

1. Bending apparatus comprising

an elongated machine bed,

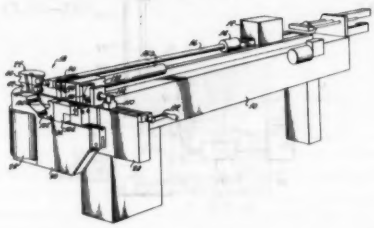
a carriage mounted for motion on the machine bed in a direction toward and away from a forward end of said bed,

a pipe holding chuck mounted on the carriage for holding a pipe with its axis aligned in said direction,

a bending head carried by the forward end of said machine bed and including first and second bend dies for bending a pipe about a bend axis,

means for mounting said bending head on said machine bed for reciprocal motion in a second direction parallel to said bend axis and in a third direction transverse to said bend axis and to said first direction, and

said bending head comprising a stationary arm assembly, and said means for mounting said bending head comprising a slide block slidably mounted on a forward end of said machine bed for motion in one of said second and third directions, means for mounting said stationary arm assembly to said slide block for slidable motion in the other of said second and third directions, a swinging bend arm



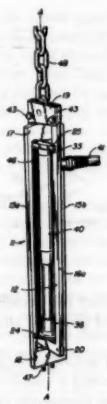
assembly mounted on said stationary arm assembly for rotation about said bend axis, said bend dies being mounted on said swinging bend arm assembly, whereby the bend dies move together with both said stationary and swinging bend arm assemblies in said second and third directions, and clamp die means carried by said swinging bend arm assembly for motion toward and away from said bend dies.

4,495,789

FRAME-STRAIGHTENING DEVICE

Peter Ivanov, 1826 S. Fitch Mountain Rd., Healdsburg, Calif. 95448

Filed Oct. 18, 1982, Ser. No. 434,769
Int. Cl.³ B21D *1/14, 3/12*
U.S. Cl. 72—302 **1 Claim**



1. A device for use with a jack cylinder for straightening frame members, comprising:

first and second outer members, each outer member comprising a pair of elongate substantially parallel arms and first and second cross members connecting said arms at the ends thereof;

said outer members being slidably mounted to one another for relative longitudinal movement with the arms of said outer members being angularly spaced about a central longitudinal axis and said first cross member of each said outer member being provided with the first and second guide members projecting to opposite sides and slidably engaging the arms of the opposite outer member to retain said first cross member therebetween;

each said guide member being formed with an outward opening U-shaped member sized to receive an arm of said opposite outer member;

retaining means secured to said first cross member of each said outer member and adapted to receive an end of a jack cylinder whereby said cylinder can be removably mounted interiorly between both said pairs of arms along said central axis;

means biasing said first cross members of said outer members toward one another for preventing accidental release of said cylinder from said retaining means;

at least one of said arms being detachably connected at an end thereof to a cross member whereby said detachably connected arm may be urged outward from its engaging U-shaped member to facilitate mounting and removal of said cylinder between said pairs of arms; and

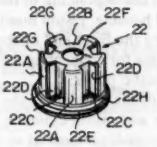
wherein said second cross member of each said outer member is adapted for connection to a frame member to be straightened.

4,495,790

METHOD FOR MANUFACTURING VALVE GUIDE FOR A HYDRAULIC DAMPER

Toshiaki Muto, and Akio Goto, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Jul. 16, 1982, Ser. No. 399,133
Claims priority, application Japan, Jul. 20, 1981, 56-107479[U]; Aug. 18, 1981, 56-129180; Aug. 18, 1981, 56-129181
Int. Cl.³ B21D *53/10*
U.S. Cl. 72—326 **2 Claims**



1. A method for manufacturing a valve guide for use in a hydraulic damper of the type including a cylinder, a piston slidably disposed in said cylinder and partitioning the interior of said cylinder into first and second oil chambers, a rod secured to said piston and extending through said first chamber to the outside, a damping force generating valve mechanism provided in said cylinder and at one end of said second oil chamber, said valve mechanism having a bottom member defining an annular valve seat thereon, a flexible valve disc cooperating with said valve seat, and a generally tubular said valve guide having a plurality of axially extending large and small diameter portions being formed integrally and alternately along the circumference thereof, said large and small diameter portions defining therebetween radially and axially extending cutouts which act as oil passages, said method comprising:

stamping or drawing a sheet metal member into a generally hat shaped configuration having an upper end wall, a cylindrical wall and a flange extending radially outwards from the lower end of said cylindrical wall;

cutting and die-forming a plurality of circumferentially spaced portions of said upper end wall and said cylindrical wall to form a plurality of circumferentially spaced small diameter cylindrical portions and a plurality of cut-outs defined between said small diameter cylindrical portions and remaining portions of said cylindrical wall; and

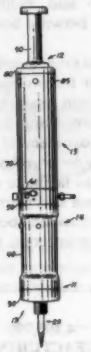
punching a central opening in the upper end wall.

4,495,791

DENT REMOVING PNEUMATIC PULLER

Jerry E. Kemnitz, 1817 Skilak Cir., Anchorage, Ak. 99504, and Ray A. Kemnitz, S. 918 Cannon, Spokane, Wash. 99204

Filed May 6, 1983, Ser. No. 492,424
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—453.02 **11 Claims**



1. A pneumatic puller for engaging and pulling a sheet of material, comprising:

a structural housing having a front end and a rear end; the structural housing having a piston cylinder therein near the rear end;

a piston slidably positioned within the piston cylinder for travel back and fourth therein; the piston having a front end and rear end corresponding to the front and rear ends of the structural housing; piston biasing means for biasing the piston toward the front end of the structural housing;

gas connection means for connecting a source of compressed gas to the pneumatic puller;

piston control means for controlling the flow of compressed gas to the piston and piston cylinder;

a point assembly rotatably mounted at the front end of the structural housing for engaging the sheet of material;

pneumatic motor means mounted to the structural housing near the front end thereof and adapted to rotate the point assembly in either direction;

pneumatic motor control means for controlling the pneumatic motor means to turn in either direction or be stationary.

4,495,792

METHOD FOR SIMULATING A SHOCK PULSE

Monty W. Bai, Scottsdale, and Alfred B. Meyer, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1983, Ser. No. 490,694
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **7 Claims**

1. A method for simulating a shock pulse on an encapsulated component comprising the steps of:

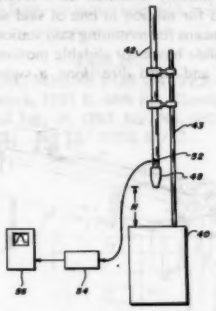
providing a pressure bar, an encapsulated component, a specimen container, and an anvil;

choosing a pressure bar mass and drop height for simulating the shock pulse;

placing said encapsulated component in said specimen container;

fixing the position of said pressure bar at said height above said anvil so that an end of said pressure bar is directed toward said anvil;

affixing said specimen container to said end of said pressure bar directed toward said anvil; and



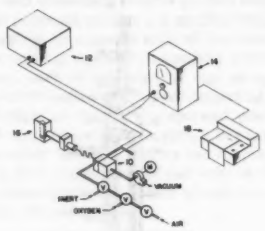
releasing said pressure bar so that said specimen container strikes said anvil.

4,495,793

SENSING DEVICE FOR DETECTING THE PRESENCE OF A GAS CONTAINED IN A MIXTURE THEREOF

Harold E. Hager, King County, Wash., assignor to Washington Research Foundation, Seattle, Wash.

Filed Aug. 30, 1982, Ser. No. 412,840
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—23 **15 Claims**



1. A sensor for detecting the presence of an oxidizable gas contained in a mixture of gases, at ambient temperature comprising:

a semiconductive film sensor surface maintained at ambient temperature and having a resistivity of at least 10^4 ohms/inch, the ability to chemisorb on its surface the oxidizable gas whose presence is to be detected, and a bandgap energy of from 0.5 eV to 5.0 eV, the surface exposed to the mixture of gases;

means for establishing an electrical potential across the sensor surface of the semiconductive film;

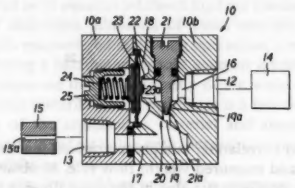
means for illuminating the film sensor surface with light energy having an intensity of 90 to 350 microwatts/Cm^2 at a frequency ranging from 380 to 680 nm to cause photodesorption/photoabsorption/photoreaction of the oxidizable gas in the gas mixture desired to be detected; and

means for measuring the transient and steady state change in conductivity of the semiconductive film as a measure of the oxidizable gas being detected.

4,495,794
AUTOMATIC ON-OFF VALVE FOR USE WITH A PNEUMATIC MICROMETER

Susumu Takada, and Hisao Sagara, both of Soka, Japan, assignors to Huskvarna Transportkonstruktioner AB, Huskvarna, Sweden

Filed Feb. 7, 1983, Ser. No. 464,557
Claims priority, application Japan, Mar. 8, 1982, 57-36093
Int. Cl.³ G01B *13/00*
U.S. Cl. 73—37.5 **2 Claims**



1. An automatic on-off valve for use with a pneumatic micrometer, comprising:

a valve body provided with an inlet for admitting pressurized air from a main body of a pneumatic micrometer and an outlet for supplying the pressurized air to a measuring head;

a main flow passage and a sub-flow passage, respectively, for providing communication between said inlet and said outlet, said main flow passage having an inlet flow passage and an outlet flow passage which communicate with one another by way of a back pressure chamber which is defined by a valve seat provided in said inlet flow passage and a valve member for opening and closing said valve seat, said sub-flow passage having a by-pass flow passage including a flow restrictor said by-pass flow passage branching from said inlet flow passage for providing continuous communication between said inlet and outlet flow passages,

a spring for biasing said valve member toward said valve seat, said spring having a biasing force sufficient to permit said valve member to open due to back pressure exerted on said valve member from said measuring head only during a measuring state and to cause said valve member to close during a not-measuring state;

a frusto-conical protrusion on said valve member at a position wherein said protrusion throttles said main flow passage during valve closing and accelerates closure of said valve member,

wherein said flow restrictor is a variable flow restritor including an adjustment screw adjustable from outside of said valve body, said adjustment screw having a needle for operating with a needle seat in said by-pass passage, the total open cross sectional area for said valve seat of said main flow passage and said flow restrictor of said sub-flow passage is set to be 6 to 9 times as large as the cross sectional area for a flow passage defined between a nozzle of said measuring head and an object to be measured upon measurement of a maximum gap.

4,495,795
PERMEAMETER

Krishna M. Gupta, Ithaca, N.Y., assignor to Porous Materials, Inc., Ithaca, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,955
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **12 Claims**

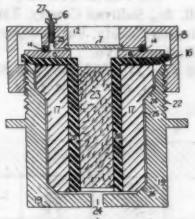
1. A sample holder for permeable materials, comprising:

a. pliable, non-porous, sleeve means for closely containing a sample, having smooth, parallel inside and outside walls, whereby the circumference of the sample is entirely enclosed by the sleeve means, leaving the ends exposed;

b. constriction means of relatively rigid material for compressing the walls of the sleeve means around the sample, surrounding the outside walls of the sleeve means, having an inside diameter which is constant over the length of the constriction means, and is approximately equal to the outside diameter of the sleeve means;

c. said inside diameter of the constriction means being adapted to reduce to a smaller diameter which is still constant over the length of the constriction means;

d. seat means for receiving the constriction means, having exit port means for escape of fluid, adapted to acting upon



the constriction means whereby as the constriction means is pressed into the seat means, the said constriction means is so constrained as to reduce in inside diameter along its length, evenly compressing the walls of the sleeve means;

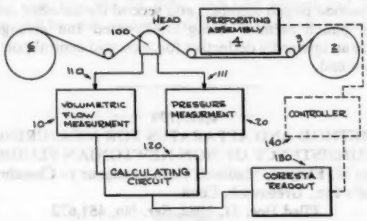
e. retaining ring means for pressing the constriction means into the seat means, having fitting means for introduction of pressurized fluid;

f. said compression of the walls of the sleeve means causing the inside walls of the sleeve means to seal tightly around the circumference of the sample.

4,495,796
APPARATUS AND METHOD FOR MEASURING PERMEABILITY OF A MOVING WEB

Benny L. Hester, and William F. Fleming, III, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Oct. 25, 1982, Ser. No. 436,239
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **14 Claims**



1. Apparatus for measuring the permeability of a continuous moving web, comprising:

a sensing head assembly in contact with the web;

means for directing a fluid flow through the web and said head;

means for measuring the volumetric flow rate of said fluid flow and generating signals analogous thereto;

means for measuring the pressure drop in said fluid flow across the web and generating signals analogous thereto, said pressure measurement simultaneous to and independent of said flow measurement;

means for calculating the permeability of the web according to the formula:

$$\text{Permeability} = \frac{\text{Measured flow rate}}{\frac{\text{Measured pressure drop}^N}{\text{Standard pressure drop}^N}}$$

where N is a constant;

means for communicating the results of said calculation as a permeability signal.

4,495,797

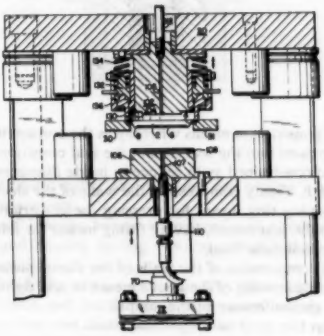
CAN END TESTER

Ernest W. Cassell, Jr., Sullivan County, Tenn., and Edward C. Gilliam, Washington County, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jun. 27, 1983, Ser. No. 508,081

Int. Cl.³ G01M *3/04*

U.S. Cl. 73—40 **10 Claims**



1. An apparatus for testing can ends comprising an entry station, a first and a second punishment station, a testing station, an output station, means for transporting said can ends between adjacent stations, and means for reciprocating opposing portions of at least some of said stations, said first punishment station comprising a first die member and a first punch member, said first die member and said first punch member being constructed and arranged to provide a downwardly deflective force on a central portion of said can end and said second punishment station comprising a second die member and a second punch member, said second die member and said second punch member being constructed and arranged to provide an upwardly deflective force on said central portion of said can end.

4,495,798

METHOD AND APPARATUS FOR MEASURING CONSISTENCY OF NON-NEWTONIAN FLUIDS

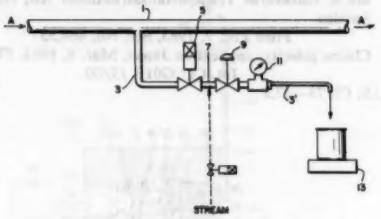
Charles W. Ehrgott, Madison, Conn., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Dec. 21, 1982, Ser. No. 451,672

Int. Cl.³ G01N *11/02*

U.S. Cl. 73—54 **15 Claims**

1. A method of measuring USDA Bostwick value consistency of a continuous production stream of tomato paste containing soluble, solids, the method comprising the steps of: establishing and maintaining a stream of said tomato paste; diverting a partial stream of said paste into a second stream thereof; regulating the flow of said paste in the second stream to achieve a predetermined pressure drop; measuring the weight flow rate of said paste in said second stream at the predetermined pressure drop; measuring the temperature of the partial stream and making a correction on the measured weight flow rate by a predetermined factor when the measured temperature differs from a predetermined temperature value; measuring the soluble solids content of said tomato paste partial stream and making a correction on the measured weight flow rate by predetermined factor when the measured amount of soluble solids differs from a predetermined soluble solids



value; and correlating, in a predetermined functional relationship the said measured weight flow rate, to obtain the USDA Bostwick consistency value of the paste flowing in said established stream.

4,495,799

DETERMINING THE LEVEL OF CONTAMINANTS IN A HYDRAULIC SYSTEM

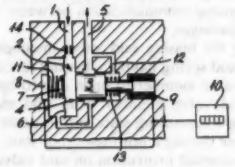
Martin J. Fisher, Milton Keynes; Roger A. Heron, Stagsden, and Martin L. Hughes, Newport Pagnell, all of England, assignors to National Research Development Corporation, London, England

Filed Dec. 3, 1982, Ser. No. 446,619

Claims priority, application United Kingdom, Dec. 4, 1981, 8136634

Int. Cl.³ G01N *15/06*

U.S. Cl. 73—61 R **18 Claims**



1. A device for determining the level of particulate contamination in a hydraulic system, comprising:

inlet means for hydraulic fluid;

outlet means for hydraulic fluid;

releasable and restorable collecting means for collecting particulate contaminants in hydraulic fluid flow between said inlet means and said outlet means, said collecting means comprising first and second components capable of relative movement and defining between them a clearance for said hydraulic fluid flow, said clearance being dimensioned to effect entrapment of said particulate contaminants and so become obstructed, said two components being a piston of circular section movable within a bore of similar section, said piston and said bore being separated by an annular gap which constitutes said clearance, and said relative movement being usable to effect said release of said collected particulate contaminants;

detecting means for detecting particulate contaminant obstruction at said collecting means above a predetermined level, and

means responsive to said detecting means for recording the occurrence of said level of obstruction, for releasing the said collected contaminants from said collecting means, and for restoring said collecting means to their unobstructed state.

4,495,800

METHOD FOR DETERMINING OPTIMUM CONCENTRATION OF HYDRATION INHIBITOR FOR CLAYS IN DRILLING FLUIDS

Roy D. Wilcox, Bellaire, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,855
Int. Cl.³ G01N 15/06
U.S. Cl. 73—61.4 17 Claims

1. A method for determining the optimum inhibitor concentration required in an aqueous inhibited fluid for maximum clay swelling and dispersion inhibition of water-wettable argillaceous materials encountered in drilling operations comprising:

(a) determining a parameter for said aqueous inhibited fluid having dispersed therein a quantity of the water-swelling argillaceous material which parameter is a function of the swelling of the argillaceous material and approaches a substantially constant value with increasing concentration of said inhibitor; and

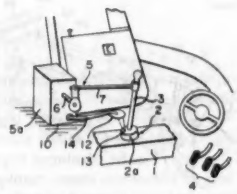
(b) determining from said parameter the minimum inhibitor concentration at which said substantially constant value is first obtained.

4,495,801

MANIPULATOR FOR SHIFTING SPEED CHANGING GEARS IN AUTOMOTIVE VEHICLES

Hiroshi Sugimoto, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,761
Claims priority, application Japan, Jul. 15, 1981, 56-111133
Int. Cl.³ G01M 15/00
U.S. Cl. 73—117 4 Claims



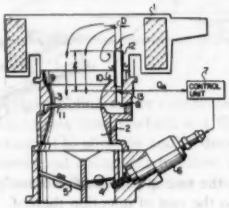
1. An automobile driving robot device having a speed changing mechanism operating device, said device being provided with means for detecting variations in a relative position between a speed changing mechanism to be operated and said speed changing mechanism operating device, and variations in the relative position and moving direction of said speed changing mechanism to be operated with respect to said speed changing mechanism operating device, and for rectifying a reference point operating said speed changing mechanism operating device, wherein said means for rectifying the reference point for operating the speed changing mechanism operating device comprises a light projecting lamp, a reflector mounted on the speed changing mechanism to be operated, and a light detector to detect light reflected from the reflector, thereby detecting the relative positional relationship between the speed of changing mechanism operating device and the speed changing mechanism to be operated.

4,495,802

AIR FLOW METER ASSEMBLY

Mineo Kashiwaya, and Kinsaku Yamada, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 331,277, Dec. 16, 1981, abandoned.
This application Feb. 29, 1984, Ser. No. 584,896
Claims priority, application Japan, Dec. 22, 1980, 55-182272
Int. Cl.³ G01N 15/00
U.S. Cl. 73—118 17 Claims



1. An air flow meter assembly for internal combustion engines, the air flow meter assembly comprising:

an air cleaner means for intaking air supplied to said engine;

throttle valve means for controlling the air flow to be supplied to said engine;

an air passage extending between said air cleaner means and said throttle valve means and having a venturi portion;

a bypass air passage means for bypassing an air flow around the venturi portion including a first by-pass air passage, a first end of said by-pass air passage having an inlet opening disposed at a portion of said air passage at a position upstream of said venturi portion, a second end of said first by-pass air passage opening into said venturi portion, and means for forming a second by-pass air passage and having a first end attached to the first end of said first by-pass passage;

means disposed in said first by-pass air passage for detecting the air flow through said by-pass air passage means; and

wherein said second by-pass air passage has a predetermined length such that a second end of said second by-pass passage is spaced from said means for detecting the air flow such that the air flowing into the by-pass air passage means is settled prior to the air flow reaching said means for detecting the air flow, and said second end of said second by-pass passage projects into said air passage.

4,495,803

METHOD OF MONITORING THE GROWTH OF CUTTINGS BEDS IN ANGLED WELL BORES

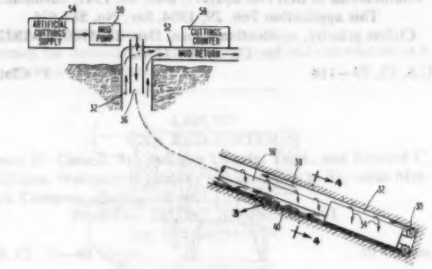
Roy D. Beasley, Denton, and James H. LaGrone, Lake Jackson, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,192
Int. Cl.³ E21B 47/00
U.S. Cl. 73—151 6 Claims

1. Method for monitoring the growth or erosion of a cuttings bed in a well being drilled in the earth comprising the steps of:

injecting artificial cuttings distinguishable from cuttings generated during said drilling operation and having a density and size comparable to the cuttings generated during the drilling operation into a stream of drilling fluid

pumped into said well during drilling to wash away cuttings generated during drilling; and



monitoring the rate of return of said artificial cuttings with respect to the rate of injection thereof.

4,495,804

METHOD OF AND APPARATUS FOR MINING ANALYSIS

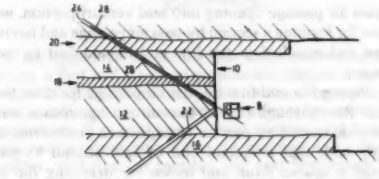
Guy Le Blanc Smith, Randburg, and Derik Howard, Johannesburg, both of South Africa, assignors to Grathnail Development Company Limited, St. Peter, Channel Islands

Filed Feb. 16, 1982, Ser. No. 348,954

Claims priority, application South Africa, Feb. 17, 1981, 81/1035

Int. Cl.³ E21B *49/00*

U.S. Cl. 73—152 **7 Claims**



1. A method of mining analysis in an underground mine comprising the steps of:

forming a plurality of boreholes in predetermined directions in rock ahead of a rock face in said underground mine, at least one of said bore holes being at an angle to the others;

for each borehole, locating a probe in the borehole;

causing the probe to move along the borehole; and

logging data which is obtained from the probe and which relates to the rock, in a recorder.

4,495,805

IN-SITU PERMEABILITY DETERMINING METHOD

Donald J. Dowling; Albert P. Richter, Jr.; Wayne F. Warren, and Dan M. Arnold, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,590

Int. Cl.³ E21B *47/10*

U.S. Cl. 73—155 **8 Claims**

1. A method of determining the permeability of a stratum in an earth formation traversed by a borehole which comprises the steps of:

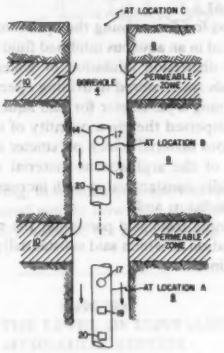
injecting a liquid into the borehole at a first pressure so as to cause liquid flow into the stratum,

determining a first flow rate of the liquid into the stratum at the first pressure,

injecting the liquid into the borehole at a second pressure causing liquid flow into the stratum,

determining a second flow rate of the liquid into the stratum at the second pressure, and

deriving an indication of the permeability of the stratum in accordance with the pressure, the two flow rates and a known characteristic of the stratum; and



each determining step includes;

measuring the flow rate of the liquid in the borehole below the stratum, and

deriving the flow rate of the liquid into the stratum in accordance with the difference between the two measured flow rates.

4,495,806

INDICATOR INSTRUMENTS

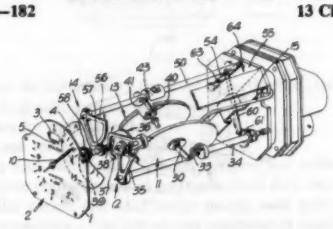
Maurice S. Jones, Cheltenham, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Mar. 28, 1983, Ser. No. 479,395

Claims priority, application United Kingdom, Apr. 2, 1982, 8209770

Int. Cl.³ G01C *21/10*

U.S. Cl. 73—182 **13 Claims**



13. A Mach/airspeed indicator instrument comprising: a first pressure capsule the deflection of which is representative of Mach number; a first finger member; means mounting said first finger member on said first pressure capsule; first indicator means that provides a display representation of Mach number; a first shaft; means coupling said first shaft with said first indicator means such that rotation of said first shaft effects displacement of said first indicator means; a first arm member; means mounting said first arm member fixedly on said first shaft to extend radially therefrom to contact said first finger member at a pivot point; a lever; means mounting said first shaft rotatably on said lever, said lever extending substantially radially of said first shaft; means mounting said lever for angular displacement about an axis substantially parallel with and separated from the axis of said first shaft; a second pressure capsule the deflection of which is representative of airspeed; a second shaft extending generally parallel with said first shaft;

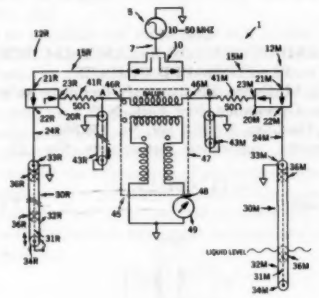
means coupling said second shaft with said second pressure capsule such that said second shaft is rotated by deflection of said second pressure capsule; second indicator means that provides a display representation of airspeed; means coupling said second shaft with said second indicator means such that rotation of said second shaft effects displacement of said second indicator means; and means coupling said second shaft with said lever such that rotation of said second shaft rotates said lever and thereby displaces said first shaft transversely of its length about said pivot point such that change in airspeed thereby alters the coupling of said first pressure capsule with said first shaft.

4,495,807

PRECISION LIQUID LEVEL SENSOR

Michael E. Field, and William H. Sullivan, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1983, Ser. No. 469,596
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—290 R **9 Claims**



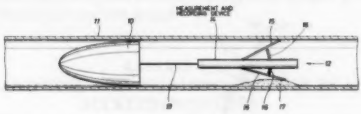
1. A precision liquid level sensor comprising:
output port means of a signal generator for providing an electrical signal;
null detector means for detecting a signal difference across two input terminals; and
power splitter means connected to said output port means for dividing said output signal into reference and measurement signal paths, each said path including:
hybrid means for conducting electrical signals substantially only from a first port to a second port and from said second port to a third port, said first port being connected to said power splitter means and said third port being connected to an input terminal of said null detector means;
said measurement path including an air dielectric line having one end connected to said second port; and
said reference path including a transmission line connected to said second port;
at least one of said paths including means for nulling the signal at said null detector means when a signal is applied to said output port;
whereby after said system is nulled, a change in liquid level along said air dielectric line of said measurement path causes a change in the signal at said null detector means, providing an indication of the change in the liquid level.

4,495,808

PARACHUTE PROFILER

Ferdinand J. Fischer, III, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 13, 1982, Ser. No. 417,269
Int. Cl.³ G01B *21/20, 21/30*
U.S. Cl. 73—432 R **3 Claims**



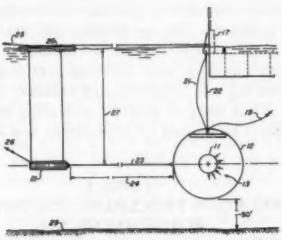
1. A fluid-propelled pipeline sensor comprising:
an umbrella-shaped tow means which is a fiber-reinforced plastic film resistant to abrasion and to decomposition by pipeline contents and collapsible to allow passage of the tow means past a substantial pipeline restriction or obstruction;
a profiler for sensing a location-specific property of the pipeline, the profiler having retractable feeler arms which allow passage of the profiler past a substantial pipeline restriction or obstruction; and
means connecting the tow means and the sensing means.

4,495,809

DEEP DEPTH UNDEX SIMULATOR

Robert R. Higginbotham, Portsmouth, and Alexander Malakhoff, Arlington, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1983, Ser. No. 480,180
Int. Cl.³ G01N *33/22, 37/00*; G01M *10/00*
U.S. Cl. 73—432 SD **1 Claim**

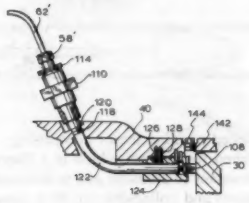


1. A deep depth underwater shockwave and hydrostatic pressure simulator means for determining the dual effects of nuclear type underwater shockwaves and hydrostatic pressures on a test vessel located in a shallow water means comprising:
a test vessel filled with air at atmospheric pressure and positioned and suspended within a pressure vessel, said pressure vessel containing fluid between the outer shell of the test vessel and the inner shell of the pressure vessel,
a pressure means for pressurizing said fluid,
a shallow body of water for positioning and suspending the pressure vessel therein,
an explosive tapered charge with the smaller tapered portion facing the pressure vessel and positioned a predetermined standoff distance from the pressure vessel within the shallow body of water,
instrument means located on and within the test vessel and the pressure vessel for recording the underwater shockwave and the hydrostatic pressure, upon exploding of the explosive tapered charge.

4,495,810
PROBE MOUNTING SYSTEM

Juergen M. Tessarzik, Schoharie; Albert Myers, Amsterdam, and James D. Yuille, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1983, Ser. No. 486,786
Int. Cl.[3] G01M *13/00*
U.S. Cl. 73—432 R 23 Claims



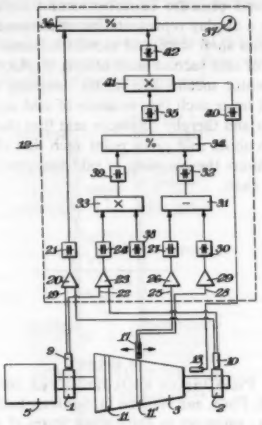
1. A system for mounting a sensing probe a predetermined distance from a target surface to be monitored comprising:
- a probe adapter;
- said sensing probe being affixed at a forward end of said probe adapter;
- an intermediate portion of said probe adapter;
- said intermediate portion including means for providing lateral flexibility and torsional stiffness thereto;
- a quill positioned in a supporting member in a predetermined location with respect to said target surface;
- means for guiding said sensing probe from an entry location to said quill;
- said means for guiding including at least one smooth bend therein;
- wherein said means for providing lateral flexibility and torsional stiffness provides sufficient lateral flexibility and torsional stiffness to permit said probe adapter to traverse said means for guiding between said entry location and said quill, past said at least one smooth bend therein;
- abutment means on said quill and said probe adapter for establishing said predetermined distance; and
- means at said entry location for producing abutment of said abutment means and for maintaining said abutment.

4,495,811
CORRELATION PROCEDURE AND DEVICE FOR ROTOR BALANCING

Michael Müller, Erzhausen; Alfred Giers, Rossdorf, and Manfred Heiland, Darmstadt-Kranichstein, all of Fed. Rep. of Germany, assignors to Carl Schenck AG:, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,903
Claims priority, application European Pat. Off., Apr. 8, 1982, 82103027.7
Int. Cl.[3] G01M *1/22*
U.S. Cl. 73—462 9 Claims

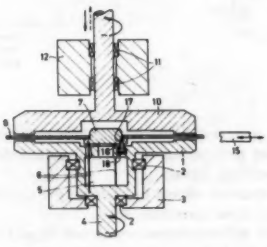
1. A procedure for determining the correlation between an unbalance in at least one correction plane of a rotor and a measuring signal generated thereby on at least one support for a rotor, particularly of a balancing machine, characterized thereby, that particularly on a flexible rotor, the deflection of the rotor is first measured at the balancing speed at one correction plane of the rotor, whereafter the vibration characteristics of at least one support are tuned and the vibrations of the rotor are measured again in the at least one correction plane and additionally at the tuned support, and that thereafter, the correlation between the unbalance and the measuring signal is described by means of the quotient derived from the difference of the deflections of the rotor in the at least one correction plane with tuned and untuned support, multiplied by the rotational frequency to the second power and divided by the product of the deflection of the tuned at least one support and a factor describing the tuning.



4,495,812
METHOD AND DEVICE FOR BALANCING CIRCULAR PLATE-SHAPED OBJECTS

Joannes J. H. M. Gorris, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,806
Claims priority, application Netherlands, Sep. 22, 1982, 8203669
Int. Cl.[3] G01M *1/38*
U.S. Cl. 73—468 7 Claims



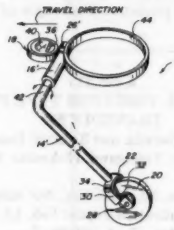
1. A method of balancing a circular plate-shaped object about a central axis of the object, the axis being perpendicular to the plane of the object, the method comprising:
- providing mounting means which are movable against a spring force disposed in a plane;
- centering the object on said mounting means with said object being disposed substantially in the plane of the spring force;
- clamping the object against at least one rotatable part of said mounting means;
- rotating the one rotatable part at a predetermined speed about a vertical axis;
- then interrupting the clamping to release the object;
- then clamping the object against the one rotatable part again;
- then changing the contour of the outer edge of said object to achieve a balance.

4,495,813

JOGGER SPEEDOMETER AND ODOMETER

Jozef Lojko, Brooklyn, and Richard L. Miller, Dix Hills, both of N.Y., assignors to Jozef Lojko, Brooklyn, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,094
Int. Cl.³ G01P *1/00*; G01B *3/12*
U.S. Cl. 73—490 **2 Claims**



1. A jogger speedometer and odometer device adapted to travel over a surface which comprises:

(a) a shaft made of aluminum having a bottom forked end;

(b) a handle made of plastic attached to top end of said shaft, the configuration of said shaft having a 90 degree sidewardly bent pivotable section adjacent said handle, and a waist band attached to said handle so as to free jogger's hand for jogging more comfortably and in a normal manner; and

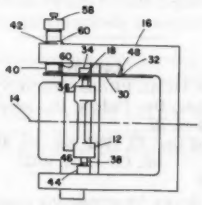
(c) an indicator unit attached to said handle; wherein said indicator unit further comprises, a drive mechanism activated by a wheel, a flexible shaft connected between said drive mechanism and said indicator unit, means for indicating total distance traveled by a jogger, and means for indicating the maximum speed attained by a jogger, said wheel being made of plastic and rotatably connected between the bifurcations of the bottom forked end of said shaft, said wheel being mechanically connected to said indicator unit to actuate said indicator unit in accordance with the relative movement between said wheel and the surface.

4,495,814

ACCELEROMETER PENDULUM SUPPORT ASSEMBLY

Kurt E. Steinke, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jun. 28, 1982, Ser. No. 393,015
Int. Cl.³ G01P *15/00*
U.S. Cl. 73—514 **12 Claims**



1. A support assembly for pivotally supporting a force responsive pendulum having an axle in an accelerometer having a support frame comprising:

a flexure member having first and second ends, and secured in a cantilevered manner with said first end secured to the accelerometer support frame wherein said flexure member is configured with a hinge portion and a statically determinate beam portion;

a first bearing secured to said flexure member adapted to receive one end of the pendulum axle;

preload means for applying a preload force to the beam portion of said flexure member; and

a second bearing adapted to receive the other end of the pendulum axle, and

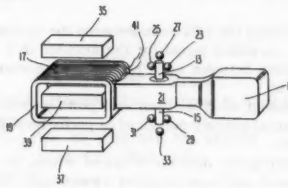
means for supporting said second bearing with respect to the accelerometer support frame.

4,495,815

MASS AND COIL ARRANGEMENT FOR USE IN AN ACCELEROMETER

Leo M. Stratton, West Chester; Kenneth J. Sipple, Chester Heights, both of Pa., and Mario B. Tatonetti, Voorhees, N.J., assignors to Columbia Research Laboratories, Inc., Woodlyn, Pa.

Filed Nov. 23, 1982, Ser. No. 443,949
Int. Cl.³ G01P *15/13*
U.S. Cl. 73—517 B **3 Claims**



1. A mass and coil assembly for use in the accelerometer comprising in combination: beam means having first and second halves, said beam means formed to have a different mass in its second half than in its first half; responsive mass means formed integral with said first half of said beam; wire coil means secured to said second half of said beam, said wire coil means and said responsive means formed such that said responsive means and said first half of said beam substantially counterbalance said wire coil means and said second half of said beam; first and second shaft means secured on opposing sides of said beam means and disposed to be between said mass means and said coil means and further disposed to lie approximately orthogonal to the axis of said coil so that when forces are applied to said mass means and/or said coil means, said assembly will rotate about said first and second shaft means; and a pair of magnets each of which is formed to have a length dimension, a width dimension and a depth dimension, and formed to have magnetic flux emanating from a first area defined by its width and length dimensions, and wherein each of said magnets is disposed to have its first area lying parallel to the axis of said coil means and wherein said magnets are disposed to have a gap therebetween and further disposed so that said coil means is located within said gap.

4,495,816

PROCESS AND SYSTEM FOR ANALYZING DISCONTINUITIES IN REASONABLY HOMOGENEOUS MEDIUM

Etienne Schlumberger, Paris, France, assignor to Medical Devices, Inc., San Francisco, Calif.

Filed May 17, 1983, Ser. No. 495,265
Claims priority, application France, May 21, 1982, 82 08883
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—600 **17 Claims**

1. A method for imaging discontinuities in an otherwise reasonably homogeneous medium, comprising the steps of:

providing at least two non-intersecting and non-parallel base lines, on opposite sides of the discontinuity to be imaged;

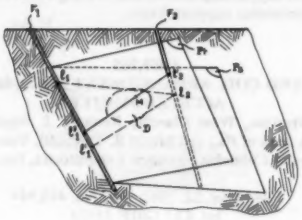
transmitting signals which will pass through the medium

toward said discontinuity from a succession of transmission points along a first one of said base lines;

picking up signals at a succession of points along a second one of said base lines from each of a plurality of said transmission points;

measuring transmission characteristics for said signals between each transmission point and each pick-up point;

determining characteristics of signal transmission through said homogeneous medium outside of said discontinuity;



determining the difference between the measured signal and the calculated signal for the distance in a homogeneous medium between each pair of transmission and pick-up points;

determining whether each said point-to-point transmission occurred entirely outside of or partly through said discontinuity;

determining the distance of travel within the discontinuity for each said point-to-point transmission; and

calculating the configuration and location of said discontinuity from said measurement.

4,495,817

ULTRASONIC IMAGING DEVICE

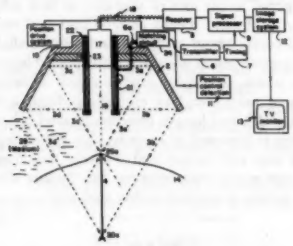
John W. Hunt, and Michael S. Patterson, both of Toronto, Canada, assignors to The Ontario Cancer Institute, Toronto, Canada

Filed May 25, 1983, Ser. No. 498,007

Claims priority, application United Kingdom, May 26, 1982, 8215357

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—624 **12 Claims**



2. An ultrasonic imaging device, comprising a transducer assembly for transmitting ultrasound pulses into a portion of a structure to be imaged and receiving ultrasound scattered by said structure portion and generating signals in response thereto, means to energize said transducer assembly to transmit said pulses, scanning means for progressively relating said transducer assembly to successive portions of said structure according to a scanning pattern, and receiver and signal processing means for assembling an image from said generated signals, the transducer assembly comprising separate transmitting and receiving transducers, one of said transducers being a simulated conical transducer having a line focus, and the other of said transducers having its axis in parallel alignment with said line focus, the scanning means being operative to move said line focus in relation to a structure to be imaged in accordance with said scanning pattern, wherein the simulated conical transducer comprises a transducer element and an associated acoustic reflector system such that an active surface of the transducer element is perceived at said line focus as a conical transducer having a surface of much larger area than said active surface and having a half angle such that rays converge on said line focus at a predetermined angle of at least 20° to the latter.

4,495,818

CYLINDRICAL VIBRATOR TYPE PRESSURE TRANSDUCER

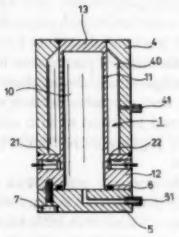
Kyoichi Ikeda; Kinji Harada, and Katsumi Isozaki, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,874

Claims priority, application Japan, Feb. 12, 1982, 57-20776

Int. Cl.³ G01N *9/00*

U.S. Cl. 73—702 **9 Claims**



1. A pressure gauge comprising

a cylindrical vibrator;

a cover for said vibrator;

means for supplying a reference pressure to said gauge;

means for supplying pressure to be measured to said gauge;

driving means for driving said vibrator; and

detector means for detecting the vibration of said vibration caused by said driving means; and wherein

said cylindrical vibrator consists essentially of a thin wall cylindrical portion, a first thick wall cylindrical portion extending from one end of said thin wall cylindrical portion, and a second thick wall end portion closing an opening at the opposite end of said thin wall cylindrical portion; and wherein

at least said thin wall cylindrical portion is installed within said cover; and wherein

said second thick wall end portion is securely attached to said cover.

4,495,819

OPTICAL PRESSURE SENSOR

Vincent J. Tekippe, Des Plaines, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 23, 1982, Ser. No. 452,760

Int. Cl.³ G01L *9/00*

U.S. Cl. 73—705 **16 Claims**

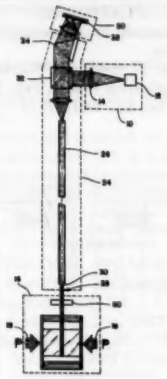
1. An optical device for monitoring pressure comprising:

(a) light-generating means for generating polychromatic light traveling in a path;

(b) pressure-sensitive means for modifying said polychromatic light in response to an applied pressure to produce wavelength dependent intensity variations of the polychromatic light said pressure-sensitive means having an integral all-glass outer housing;

(c) signal processing means for comparing said polychro-

matic light with said wavelength dependent intensity variations of polychromatic light; and



(d) transport means for transporting said polychromatic light from said light generating means to said pressure-sensitive means and for transporting light from said pressure-sensitive means to said signal-processing means.

4,495,820

CAPACITIVE PRESSURE SENSOR

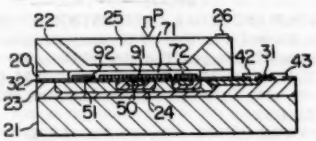
Satoshi Shimada; Kazuji Yamada, both of Hitachi; Seikou Suzuki, Hitachiota, and Motohisa Nishihara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,084

Claims priority, application Japan, Sep. 30, 1981, 56-153611

Int. Cl.³ H01G *7/00*; H01L *29/84*

U.S. Cl. 73—724 **14 Claims**



1. A capacitive pressure sensor comprising:

a first semiconductor substrate with an amplifier formed on the main surface;

an insulating layer formed on said amplifier;

at least one electrode formed on said amplifier through said insulating layer and electrically connected to said amplifier;

a second semiconductor substrate serving as a diaphragm and disposed in opposition to said electrode for forming a capacitor; and

a glass layer anodically bonding said first and second semiconductor substrates to each other in the region of peripheral portions of said electrode and said diaphragm.

4,495,821

MAGNETOSTRICTIVE PRESSURE DETECTOR

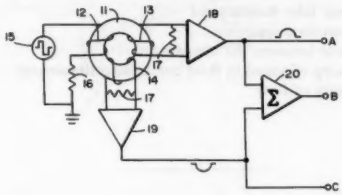
James H. Terhune, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jan. 31, 1983, Ser. No. 462,328

Int. Cl.³ G01L *9/15*

U.S. Cl. 73—753 **7 Claims**

1. A pressure detection arrangement for self-checking the operability status of said pressure detection arrangement comprising at least a single magnetostrictive means for responding to pressure, an input winding and at least a pair of output windings, each of said windings communicating magnetically with said magnetostrictive means, said output windings effective for producing respective output indications representative



of an input signal on said input winding and the pressure applied at said magnetostrictive means, and circuitry means for developing an indication of the operability status of said arrangement in view of output indications from said output windings.

4,495,822

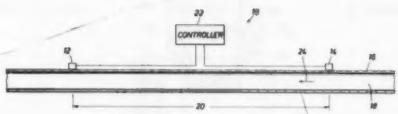
FLUID FLOW METER

Thomas R. Schmidt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1982, Ser. No. 452,688

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.27 **2 Claims**



1. An apparatus for determining the velocity of a stream in a tubular member, said apparatus comprising: a first source means for providing a first pulse of ultrasonic energy to a wall of said tubular member at a first predetermined location so that said first pulse of ultrasonic energy induces a first compressional wave in said stream; a second source means for providing a second pulse of ultrasonic energy to said wall of said tubular member at a second predetermined location so that said second pulse of ultrasonic energy induces a second compressional wave in said stream, said second predetermined location being spaced from said first predetermined location by a distance that is at least as large as the distance required for said first pulse of ultrasonic energy to induce said first compressional wave in said stream, said distance between said first and second predetermined locations also being at least as large as a distance equal to two times the diameter of said tubular member; a first means for sensing said second compressional wave at said first predetermined location; a second means for sensing said first compressional wave at said second predetermined location, said first source means and said first sensing means comprising the same first piezoelectric transducer and said second source means and said second sensing means comprising the same second piezoelectric transducer, said first and second transducers being positioned on the same side of said tubular member; controller means for determining a first amount of time elapsed between the providing of said first pulse of ultrasonic energy by said first source means and the sensing of said first compressional wave by said second sensing means, for determining a second amount of time elapsed between the providing of said second pulse of ultrasonic energy by said second source means and the sensing of said second compressional wave by said first sensing means and for determining the flow velocity of the stream in the tubular member in accordance with the following equation:

$$T_D = L \div (V_s + V_f)$$

$$T_U = L \div (V_s - V_f)$$

wherein

T_D = transit time downstream

T_U = transit time upstream

L = distance between the transducers

V_s = velocity of sound in fluid comprising the stream

V_f = velocity of flow.

4,495,823

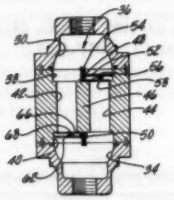
BIDIRECTIONAL FLOW METER

Lars O. Rosaen, Hazel Park, Mich., assignor to Universal Filters, Inc., Hazel Park, Mich.

Filed May 31, 1983, Ser. No. 499,300

Int. Cl.³ G01F *1/28*

U.S. Cl. 73—861.76 **10 Claims**



1. A bidirectional fluid flow indicator comprising:

a housing having a fluid inlet and a fluid outlet, and having means for defining separated first and second fluid passageways intermediate said inlet and said outlet, a first end of each of said first and second passages being in fluid communication with one of said inlet or said outlet, a second end of each said first and second passage being in fluid communication with the other of said inlet or outlet;

a first vane and means for pivotally securing said first vane across said first end of said first passageway so that said first vane is pivotable to and from a first position at which said first vane closes said first passageway when fluid flows in a first direction between said inlet and said outlet, and a second position at which said first vane opens said passageway as fluid flows in a second, opposite direction between said inlet and said outlet;

a second vane, and means for pivotally securing said second vane across said second end of said second passageway so that said second vane is pivotable to and from a first position at which said second vane closes said second passageway when fluid flows in said second opposite direction between said inlet and said outlet, and a second position at which said second vane opens said second passageway when fluid flows in said first direction between said inlet and said outlet;

wherein said second position of said first and second vanes is variable and dependent upon the amount of fluid flowing between said inlet and said outlet;

first indicating means for indicating the position of said first vane exteriorly of said housing; and

second indicating means for indicating the position of said second vane exteriorly of said housing.

4,495,824

MEANS OF MEASURING STRESS AFFECTING MOUNTINGS FOR JACKING MECHANISMS ON OCEAN PLATFORMS

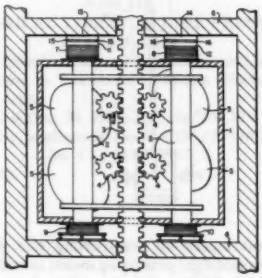
Olivier Dantan, Bouguenais, France, assignor to Brissonneau et Lotz Marine, France

Filed Jan. 27, 1983, Ser. No. 461,542

Claims priority, application France, Feb. 1, 1982, 82 01536

Int. Cl.³ G01L *1/14*

U.S. Cl. 73—862.64 **5 Claims**



1. In an ocean platform and the like in which the weight of the platform is applied, in compression, to legs by means of jacking mechanisms attached to the platform by mountings that include flexible components and that allow limited movement of the legs relative to the platform, the improvement comprising a combination of calibrated compressible components situated between the platform and at least one of the mountings, and at least one sensor device situated between the platform and said one of the mountings, said sensor device including means for producing an electrical output dependent upon the stress applied to said one of the mountings.

4,495,825

STARTER FOR INTERNAL COMBUSTION ENGINES

Walter Rühle, Korntal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

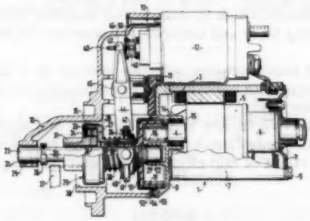
PCT No. PCT/DE81/00184, § 371 Date Aug. 11, 1982, § 102(e) Date Aug. 11, 1982, PCT Pub. No. WO82/02419, PCT Pub. Date Jul. 22, 1982

PCT Filed Oct. 31, 1981, Ser. No. 413,343

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100869

Int. Cl.³ F02N *15/06*

U.S. Cl. 74—7 E **6 Claims**



1. A starter for an internal combustion engine comprising:

a starter motor **(1)** having an output drive shaft **(4)** with a toothed end section **(16)**;

a starter pinion **(31)**, disposed in a rotatable and longitudinally movable manner on a gear shaft **(20)**;

a sleeve **(18)** disposed around said gear shaft **(20)** and having a highly pitched spirally splined section **(19)**;

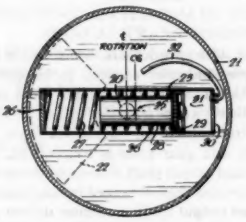
a spur gear arrangement (16,17,18) including said drive shaft,
a freewheel (29) and a coupling element (26), which is movably disposed on said high-pitch thread (spiral spline) section (19), operatively connecting the starter pinion (31) to the spur gear,
wherein
the spur gear arrangement has an internally geared wheel (17),
said internally geared wheel (17) is integrally formed with said sleeve (18);
said coupling element (26) is seated on said sleeve (18); and
said internally geared wheel (17) is journalled on the gear shaft (20) and is in meshing engagement with said toothed end section (16) provided on the drive shaft (4).

4,495,826

VIBRATORY APPARATUS

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Continuation-in-part of Ser. No. 250,112, Apr. 2, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,602
Int. Cl.³ F16H *33/10*
U.S. Cl. 74—87 **14 Claims**



1. Apparatus for varying the vibratory force generated by a rotating mass comprising a rotatably mounted shaft, an eccentric weight mounted in a fixed position on the shaft, means for rotating the shaft, a cylinder carried by the shaft, said cylinder extending radially on either side of said shaft, a weight mounted for axial movement in the cylinder, a tension and compression spring in the cylinder urging the movable weight toward a position with the center of gravity on one side of the axis of the shaft, said spring being attached at one end to the cylinder and at the other end to the movable weight, fluid pressure responsive means in the cylinder and bearing on the side of the movable weight opposite to the spring to move the movable weight from the position on one side of the axis of the shaft toward a position on the other side of the axis of the shaft and means connecting said fluid pressure responsive means to a source of fluid under pressure.

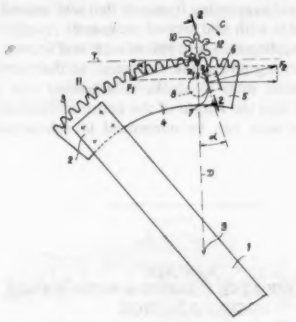
4,495,827

GEAR DRIVE DEVICE AND THE APPLICATION THEREOF IN A WINDOW WINDER OF AN AUTOMOBILE VEHICLE

Roger Parizet, Bonnee, France, assignor to Compagnie Industrielle De Mecanismes en abrege C.I.M., France

Filed Aug. 19, 1982, Ser. No. 409,741
Claims priority, application France, Aug. 31, 1981, 81 16555
Int. Cl.³ F16H *27/02, 29/02, 29/20;* **E05F** *11/44*
U.S. Cl. 74—89.18 **7 Claims**

1. A gear drive device comprising a support member, a drive pinion rotatably mounted on the support member, a driven toothed element movably mounted on the support member, a stop element mounted in a fixed position on the support member, an abutment in a fixed position on the toothed element and capable of abutting against the stop element at an end-of-travel position of the toothed element, the pinion and the toothed element respectively having teeth engaging each other so as to generate a driving force at a positive pressure angle relative to the tangent to the pitch circle of the pinion, and means for pressing the toothed element and the pinion against each other



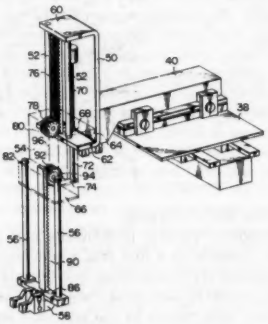
so as to generate an abutment force which is parallel and substantially opposed to said driving force when the abutment is cooperative with the stop element.

4,495,828

STROKE ENLARGING MECHANISM

Norihiro Iwamoto, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,543
Claims priority, application Japan, Mar. 31, 1981, 56-48200
Int. Cl.³ F16H *19/04, 19/06*
U.S. Cl. 74—110 **4 Claims**



1. A stroke enlarging mechanism comprising:
a stationary supporting frame having a predetermined length L;
a stationary guide member secured to said supporting frame so as to extend along the length of said supporting frame;
a saddle member movable along said guide member;
an operating arm supported by said saddle member to be movable along the length of said supporting frame;
an actuator secured to said supporting frame for driving said saddle member along said guide member;
a first rack secured to said supporting frame and extending along its length;
a second rack secured to said operating arm to be movable therewith along the length of the supporting frame;
said stationary guide member, said saddle member, said actuator, said operating arm and said first and second racks having lengths substantially equal to the length L of said supporting frame and disposed at positions substantially included within the length L of said frame;
a first pinion rotatably mounted on said saddle member at a first position thereof to be engageable with said first rack;

a second pinion rotatably mounted on said saddle member at a second position thereof, which is spaced apart from said first position by a predetermined distance D along the length of said supporting frame, so that said second pinion is engageable with said second rack; and

means for coupling said first pinion with said second pinion for transmitting power therebetween, so that not only a predetermined ratio of stroke enlargement can be obtained, but also the length of the entire mechanism in an inoperative state can be minimized to substantially be equal to L.

4,495,829

POWER DRIVE LINE HAVING A WIDE RANGE OF SPEED RATIOS

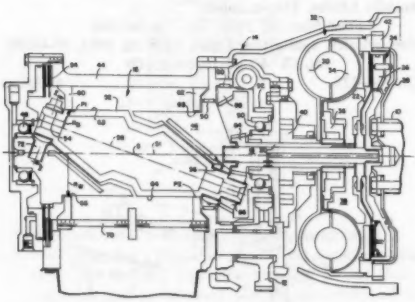
Yves J. Kemper, Birmingham, Mich., assignor to Ipanema Company, Birmingham, Mich.

PCT No. PCT/US80/00584, § 371 Date Dec. 23, 1981, § 102(e) Date Dec. 23, 1981, PCT Pub. No. WO81/03370, PCT Pub. Date Nov. 26, 1981

PCT Filed May 19, 1980, Ser. No. 335,510

Int. Cl.³ F16H *15/16*; G05G *1/00*; F16H *47/08, 37/06*

U.S. Cl. 74—191 **13 Claims**



1. A drive line comprising:

a continuously variable transmission unit having an alpha body rotatable on a first axis, a beta body rotatable on a second axis revolvable about said first axis, said beta body being carried by said alpha body so that said second axis is inclined with respect to and intersects said first axis at a point of axes intersection, said beta body having at least one rolling beta surface of revolution about said second axis, and variable means for controlling relative movement of said bodies, said variable means including means defining at least one rolling omega surface of revolution about said first axis, means to retain said beta and omega surfaces in rolling friction contact and means to vary the radius ratio of one of said beta and omega rolling surfaces to the other of said rolling surfaces;

planetary gear means including a sun gear rotatable on said first axis, a ring gear rotatable on said first axis and planet gear means in mesh with said sun and ring gears, said planet gear means being coupled for rotation with and carried on said other working body;

a power input;

a power output drivably connected to said ring gear; and

means for coupling said power input to one or the other of said sun gear and said alpha body to provide a low drive line speed ratio range when said power input is coupled with said alpha body, the speed ratio in each of said ranges being determined by said variable means.

4,495,830

AUTOMATIC TRANSMISSION FOR A VEHICLE

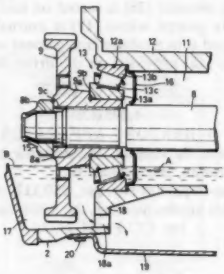
Hideki Yasue, and Kagenori Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 1, 1982, Ser. No. 394,307

Claims priority, application Japan, Sep. 11, 1981, 56-144335

Int. Cl.³ F16H *57/04*

U.S. Cl. 74—467 **5 Claims**



1. In combination with an automatic transmission for a vehicle having a torque converter adapted to be driven by an engine, an input shaft into which an output from said torque converter is transmitted, a gear train into which an output from the input shaft is transmitted, an output shaft into which an output changed by said gear train is transmitted, a counter drive gear fixed to said output shaft at one end thereof opposite said input shaft, a counter shaft arranged in substantially parallel relation with said output shaft, a counter driven gear fixed to said counter shaft at one end thereof and meshed with said counter drive gear, a differential drive pinion gear fixed to said counter shaft at the other end thereof and meshed with a drive gear for a differential gear, first and second tapered roller bearings provided in the vicinity of said counter driven gear and said differential drive pinion gear, respectively, for supporting said counter shaft, said counter shaft being accommodated in a counter shaft chamber of a transmission casing, said counter driven gear being accommodated in a transfer chamber adjacent to said counter shaft chamber and separated therefrom by said first tapered roller bearing, transmission oil being stored in the lower spaces of said counter shaft chamber and said transfer chamber, the lower portions of said counter driven gear and said first tapered roller bearing being immersed in said transmission oil; the improvement comprising a disc-like oil deflector having a central aperture and fixed to the inner wall of said counter shaft chamber adjacent to the smaller end of said first tapered roller bearing, said counter shaft being loosely inserted into said central aperture of said oil deflector.

4,495,831

SHIFT FORK

Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 350,385, Feb. 19, 1982, abandoned. This application Jun. 8, 1984, Ser. No. 618,759

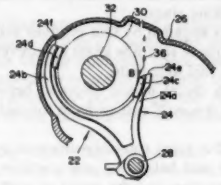
Claims priority, application Japan, Feb. 20, 1981, 56-22892

Int. Cl.³ G05G *3/00*; F16D *13/58*

U.S. Cl. 74—473 R **2 Claims**

1. A shifting mechanism in an automotive transmission comprising a collar and a shift fork having a pair of upwardly extending forked branches engaging said collar for shifting the transmission, at least one of said branches having an upper end located radially outward from the collar and which is bevelled along substantially entirely an upper end face thereof so as to be inclined downwardly toward said collar so that lubricant

dripping downward from a position vertically offset and radially outward from the collar is introduced to portions of said



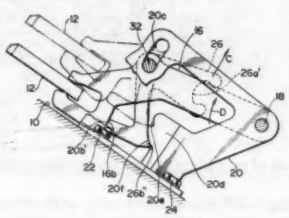
collar engaging with said shift fork by dripping onto said bevelled upper end of the shift fork branch to flow therealong to the collar.

4,495,832

GEAR OPERATING MECHANISM OF AN AUTOMOTIVE MANUAL TRANSMISSION

Kazuyoshi Hiraiwa, and Akio Kawaguchi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 18, 1982, Ser. No. 379,508
Claims priority, application Japan, May 19, 1981, 56-74100
Int. Cl.³ B60K *20/00*; G05G *5/10*
U.S. Cl. 74—475 **11 Claims**



1. In a selected gear sliding type manual transmission having a gear being axially movable from a neutral position where it disengages from the associated gears to an operating position where it engages with the associated gears by means of a speed change shift lever of the transmission, a gear operating mechanism comprising:

a supporting bracket secured to a case of the transmission;

a first lever pivotally connected to said supporting bracket to move said gear between said neutral and operating positions in response to movement of the speed change shift lever; and

means connecting the first lever to the speed change shift lever and being movable between first and second conditions in response to movement of the shift lever to move the first lever between positions corresponding to neutral and operating positions of the gear, wherein said means includes a pivotal latch mechanism which in said first condition enables said first lever to be locked in a position to cause the gear to assume the operating position, and in said second condition enables said first lever to assume another position to cause the gear to assume the neutral position,

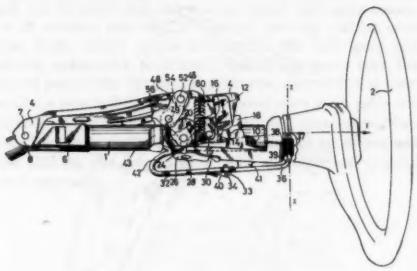
said latch mechanism including a pawl being engageable with the supporting bracket and arranged to prevent disengagement of the gear from the operating position to neutral position.

4,495,833

STEERING COLUMN ADJUSTABLE IN HEIGHT

Francois Fourrey, Montbeliard, and Jean-Francois Mauffrey, Danjoutin, both of France, assignors to Cycles Peugeot, Valentigney, France

Filed Sep. 30, 1981, Ser. No. 307,266
Claims priority, application France, Oct. 13, 1980, 80 21809
Int. Cl.³ B62D *1/18*; G05G *5/18*
U.S. Cl. 74—493 **11 Claims**



1. A steering structure for a vehicle and comprising a steering column which has a tube, a first steering shaft portion within the tube, an articulation connecting the first shaft portion to a second steering shaft portion adjacent a lower end of the first steering shaft portion, a steering wheel mounted on the first steering shaft portion adjacent an end of the first steering shaft portion opposed to said articulation, a plate for supporting associated controls and rigid with the tube, a fixed support for fixing to said vehicle, the support plate being mounted on the fixed support to pivot about an axis coaxial with said articulation, a locking device for locking said plate with respect to said support, the locking device including a movable member which is movable between a first position in which the locking device is operative to lock said plate to said support and a second position in which the locking device is inoperative, a cranked unlocking lever which is pivotable substantially in a plane parallel to a plane containing said tube and extending laterally of said tube, from a position in which the unlocking lever is at rest and spaced away from said movable member of said locking device to a position of engagement with said movable member of said locking device, and then farther to an unlocking position for shifting said movable member to said second position thereof, and means for elastically biasing said lever from said unlocking position to said position of rest which position of rest corresponds to the locking of said plate by said locking device, said lever having an actuating knob which is spaced sufficiently away from said steering wheel to avoid hindrance to hands of the user on said steering wheel in said position of rest and is in closer proximity to said steering wheel in said position of engagement with said movable member so as to enable the user to bring said lever to said unlocking position thereof while maintaining his hands on the steering wheel.

4,495,834

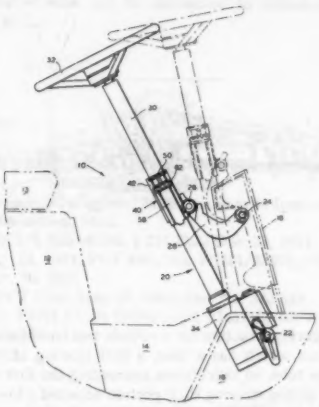
ADJUSTABLE STEERING COLUMN

James J. Bauer, Richland, and Vilnis Strautins, Kalamazoo, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 22, 1982, Ser. No. 351,084
Int. Cl.³ B62D *1/18*
U.S. Cl. 74—493 **5 Claims**

1. An adjustable steering column assembly for vehicles having a hand wheel and steering column for steering the vehicle pivotally adjustable forwardly and rearwardly of the vehicle, a first pivot fixed in relation to the vehicle on which the steering

column is mounted and about which it is adjustable, a second pivot located above the steering column and fixed in relation to the vehicle, a third and movable pivot operatively connected to the steering column and connection to said second pivot by a swingable link, said third pivot being connected to a latch assembly which is mounted on the steering column and is slidable longitudinally thereof, said latch assembly including a collar and housing slidable along the steering column and extending outwardly of one side thereof, a detent device



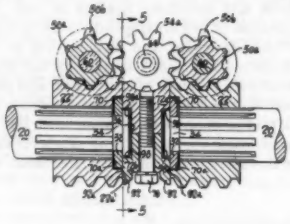
mounted in said outward extension for locking said latch assembly to a selected position axial of said steering column, and a manually operated latch for actuating said detent device to release said latch assembly for axial adjustment on said steering column, said detent device including a spring actuated element and a locking element movable between said engaged and disengaged positions by said spring actuated element such that when said latch assembly is engaged the angle of said steering column is fixed by said locked condition of said latch assembly at which a detent device engages said steering column.

4,495,835

DIFFERENTIAL GEARING ASSEMBLY

Vernon E. Gleasman, Cleveland Heights, Ohio, assignor to The Gleason Works, Rochester, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,526
Int. Cl.³ F16H *1/38, 1/42, 57/02*
U.S. Cl. 74—715 **7 Claims**



1. In a differential assembly of the type including a differential case having means for receiving a pair of axle ends, side gears disposed within said case and rotatably coupled to said axle ends, at least one transfer gear associated with each side gear defining a side gear engaging portion and a balancing gear portion at each end, said transfer gears being arranged in pairs such that a transfer gear associated with one side gear is paired with a transfer gear associated with the other side gear, and each transfer gear pair being rotatably mounted in a window defined by said case, an improvement in said differential assembly employing internal locking elements for retaining said axle ends within said case comprising:

(a) a pair of axle ends, each defining an annular groove for receiving locking rings;

(b) locking rings engaged by said grooves and abutting side surface portions of said side gears for preventing outward movement of said axle ends;

(c) axle spacing thrust means disposed between said axle ends defining spaced thrust surfaces for said axle ends and side gears;

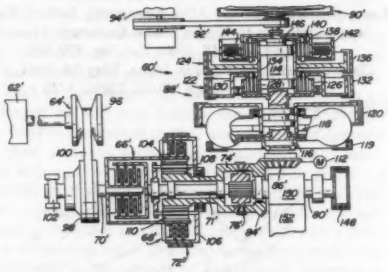
(d) reversible idler gears rotatably mounted in said window and engaging said balancing gear portions for rotatably coupling respective transfer gears of said transfer gear pair, said reversible idler gears operating to balance end thrust between said side gears and said reversible idler gears defining a clearance opening within said window of sufficient expanse to allow removal of said axle spacing thrust means and in turn said locking rings.

4,495,836

AUTOMOTIVE VEHICLE POWER DRIVE SYSTEM

Max Cohen, 489 Locust La., Cape May Courthouse, N.J. 08210

Filed Jun. 14, 1982, Ser. No. 388,055
Int. Cl.³ F16H *3/74, 37/06, 37/00*; **G05G** *1/00*
U.S. Cl. 74—751 **17 Claims**



5. A method of providing power for driving a vehicle comprising:

(a) providing a differential mechanism with three elements;

(b) providing an output shaft which at one end is operatively connected to the vehicle wheels and at the other end is operatively connected to a first element of said differential mechanism;

(c) providing a prime mover operatively connected to a second element of said differential mechanism;

(d) providing an energy accumulating flywheel operatively connected to a third element of said differential mechanism;

(e) storing energy from time to time in said accumulating flywheel by causing it to accelerate its rotation without drawing energy from the prime mover using a braking force on said output shaft caused by application of a braking force against rotation of said second element so that said output shaft drives said flywheel through said third element;

(f) providing the driving power to drive said first element of said differential mechanism when said flywheel is turning so that said prime mover and said flywheel both simultaneously mechanically independently drive said output shaft through said differential mechanism, permitting the speed of said wheels to vary or remain constant regardless of the speed of said flywheel, over a range of speeds without it being necessary to change a transmission ratio, and driving said output shaft by variably controlling the driving torque applied to said second element of said differential mechanism by said prime mover;

(g) providing consistent and uniform vehicle acceleration performance by:

(1) conserving flywheel energy for acceleration by disconnecting the coupling between the flywheel and the drivewheels except during acceleration and braking, and

(2) controlling automatically in a preprogrammed manner the amount of energy withdrawn during acceleration over the vehicle operating speed range by controlling the relationship of power delivered by the prime mover and flywheel by controlling the relationship of the speeds of the second and third elements of the differential,

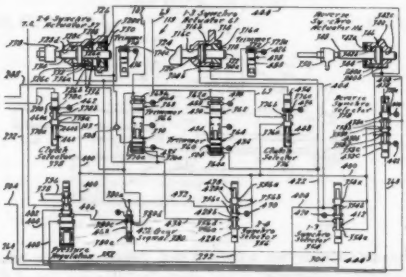
(h) including controlling by variable ratio transmission means the relative speeds of the second and third elements of said differential during acceleration of the vehicle, so as to control the amount of power consumed from the flywheel during acceleration from one vehicle speed to a higher vehicle speed to an amount equal to that available from the average brake energy recovery and storage process when braking the vehicle between those two speeds.

4,495,837

TRIMMER VALVE

Timothy J. Morscheck, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 16, 1981, Ser. No. 331,391
Int. Cl.³ B60K *41/08;* F16H *5/42, 3/08*
U.S. Cl. 74—869 **9 Claims**



1. In a trimmer valve of the type including a bore, a first port adapted to receive a first pressurized fluid, an exhaust port axially spaced from the first port, a valving member disposed in the bore with one end in direct communication with the first port and slidably moveable from a position blocking communication between the ports in response to the first pressure applying a fluid force to the surface area of the one end of the valving member, a first piston slidably disposed in the bore at the other end of the valving member and defining therewith an expandable chamber communicating with the first port via an orifice, and a spring having one end biasing the piston toward the valving member for moving the valving member to the blocking position with a spring force which yields to said fluid force and increases with said fluid force, whereby initial application of the pressure of the first fluid at the first port moves the valving member from the blocking position and whereby the first fluid also flows to the expandable chamber via the orifice to expand the chamber and gradually move the valving member back to the blocking position, the improvement comprising:

a second port adapted to receive a second pressurized fluid independent of the first fluid; and

a second piston slidably disposed in the bore and providing a moveable reaction surface for the spring, said second piston moveable from a position allowing a maximum extension of the spring in the absence of said second pressure and moveable to a position allowing a minimum extension of the spring in response to the presence of said second pressure.

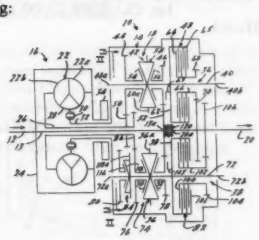
4,495,838

REVERSE PRESELECT CONTROL

Douglas C. Gooch, Galesburg, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 16, 1981, Ser. No. 331,393
Int. Cl.³ B60K *41/10;* F16H *3/08, 5/42*
U.S. Cl. 74—869 **7 Claims**

4. In a transmission of the type including input and output shafts; a plurality of power paths disconnectable from both shafts; a plurality of forward speed ratio gears associated with one path and in constant driving relation with one of the shafts; at least one forward and one reverse speed ratio gear associated with another path and in constant driving relation with the one shaft; clutch means associated with each gear and selectively engageable to connect one of the gears with the associated path while the path is otherwise disconnected from the shafts; a powershift clutch associated with each path and alternately engageable to complete driving communications between the shafts via the selected one gears for up, down, and reverse shifting the transmission; and an improved control system comprising:



shift selector means including means moveable between forward, neutral, and reverse positions; and

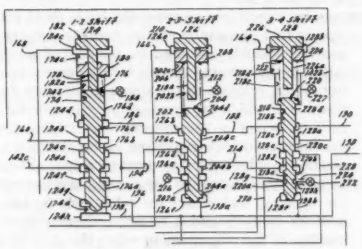
reverse means operative to effect engagement of the clutch means associated with the reverse gear in response to neutral positioning of said shift selector means position.

4,495,839

TRANSMISSION SHIFT VALVE

Timothy J. Morscheck, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 16, 1981, Ser. No. 331,397
Int. Cl.³ B60K *41/08*
U.S. Cl. 74—869 **6 Claims**



1. In a transmission of the type including at least two step ratio gears automatically shifted into and out of engagement at predetermined shift points in response to substantially simultaneous and alternate engagement and disengagement of at least two powershift clutches by a control system including shift selector means having at least two selectable positions, means providing a force proportional to the transmission output speed, and a shift valve having a valving member biased in opposite directions by a resilient force and the proportional force with valving member moved to a first position effecting engagement and disengagement of selected ones of the

clutches when the resilient force exceeds the proportional force and moved to a second position effecting opposite engagement and disengagement of the selected ones of the clutches when the proportional force exceeds the resilient force; the improvement wherein the shift valve further comprises:

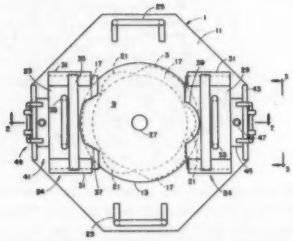
means operative to vary the resilient force biasing the valving member in response to the position of the shift selector means, the valving member being a spool valve disposed in a bore, the resilient force being provided by a spring acting at one end on the spool and reacting at the other end against a piston moveable in the bore in response to the position of the shift selector.

4,495,840

BIT BREAKER

Gary T. Freitag, Webster, and Roger C. Smith, Houston, both of Tex., assignors to Reed Rock Bit Company, Houston, Tex.

Filed Jul. 15, 1983, Ser. No. 514,389
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—54 **10 Claims**



1. A bit breaker adapted to be fitted in the Kelly drive of a drill rig for detachably securing a rotary drill bit to the Kelly drive to enable the latter to rotate the bit relative to a drill string having an internally threaded lower end portion in one direction to effect a threaded connection between the threaded pin of the bit and the string, and in the other direction to disconnect the bit from the string; said bit breaker comprising:

a bottom engageable by the bottom of a bit for supporting the bit;

a top having an opening therein through which the bit may be lowered into engagement with the bottom of the bit breaker and may be raised to remove the drill bit from the bit breaker; and

means for selectively securing the bit in fixed annular position in said opening in the bit breaker comprising a stop member slidably mounted on the top of the bit breaker adjacent the opening therein for movement inwardly and outwardly relative to the opening between an extended position in which the stop member engages the side of the drill bit when in the opening for holding the drill bit against rotation relative to the bit breaker and a retracted position in which the stop member is spaced from the drill bit to enable the drill bit to be raised and lowered through the opening, and means for selectively locking the stop member in its extended position, thereby preventing retraction of the stop member when the drill bit is rotated.

4,495,841

AUTOMATIC SCREWDRIVER

Takashi Mori, Koriyama; Kouichi Miza, Hirakata, and Yasunori Jo, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 21, 1982, Ser. No. 370,194
Int. Cl.³ B25B *23/06*
U.S. Cl. 81—430 **11 Claims**

1. An automatic screwdriver for driving a screw into a workpiece, comprising:

a frame;

a chute mounted on said frame for supporting a plurality of screws arranged in a row in the chute, said screws having shanks directed generally parallel to each other in a first direction;

a gate mounted on said frame at one end of said chute and being selectively openable to allow the screws to be discharged one at a time out of said chute;

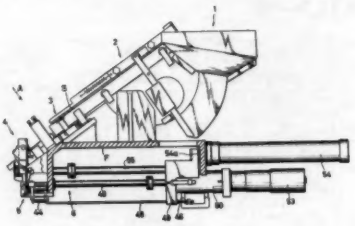
an index mechanism mounted on said frame and having a carrier arm angularly movable between a first position in which said carrier arm receives a screw discharged by said gate and a second position in which said screw is oriented in a second direction different from said first direction;

a catcher unit mounted on said frame at said second position to receive the screw supplied from said index mechanism;

a screwdriver bit unit mounted on said frame and having an axially movable suction pipe for drawing the screw from said catcher unit into the pipe and towards a screwdriver bit rotatably disposed in said suction pipe for axial movement therewith to advance the screw past said catcher unit;

means for actuating the gate and said index mechanism; and means for actuating said screwdriver bit unit;

wherein said chute has a groove extending therealong to receive the shanks of said screws, said gate including an



escape slide having a curved slot, the escape slide being slidable transversely of said chute for allowing one of the screws at a time to move along said groove and said curved slot past said gate and wherein said escape slide has a roller cam follower, said gate and index mechanism actuating means having a cam surface engageable with said roller cam follower for moving said escape slide to open said gate in response to movement of said carrier arm to said first position.

4,495,842

THRUST BEARING SCRAPING TOOL

Daniel G. Starta, Trafford, and Richard W. Hood, Greensburg, both of Pa., assignors to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Apr. 18, 1983, Ser. No. 486,135
Int. Cl.³ B23B *5/00*
U.S. Cl. 82—4 R **3 Claims**

1. A bearing scraping tool comprising:

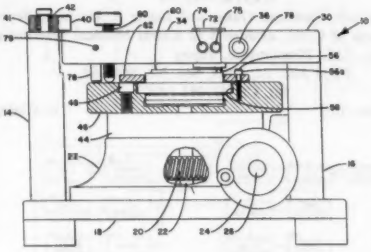
means mounting a bearing;

means rotating said means mounting a bearing;

cutting means;

means pivotally mounting said cutting means with respect to said means mounting a bearing whereby said cutting means moves vertically and angularly with respect to said means mounting a bearing when pivoted;

means resiliently biasing said means pivotally mounting towards said means mounting a bearing;



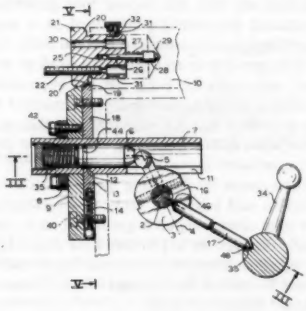
means pivotally moving said cutting means when said means mounting a bearing is being rotated.

4,495,843

AUTOMATIC UNCOUPLING DEVICE

Romeu Romi, Sao Paulo, Brazil, assignor to Industrias Romi S/A, Sao Paulo, Brazil

Filed Jul. 23, 1982, Ser. No. 401,325
Int. Cl.³ B23B *21/00*
U.S. Cl. 82—23 **19 Claims**



1. An automatic uncoupling device for opening half-nuts for cutting threads mounted on a machine having an apron supporting the half-nuts and a stop means, the device being mounted in the apron and comprising a control lever supported on a turnable shaft having means thereon operatively connecting said shaft to said half-nuts; a disc rigidly supported on said turnable shaft and having an arm radially outwardly extending therefrom; said arm having a free end and including a ball at said free end rigidly connected to the arm; a hollow cartridge mounted in the machine apron; a movable pin in said cartridge and having one end engaged with said ball and an opposite end, said one end being tapered, first spring means urging said pin towards said ball and ensuring a permanent contact of said tapered end with said ball, a trigger element having a portion aligned with said opposite end so as to be engageable with said opposite end; second spring means biasing said trigger element towards said opposite end; and displaceable means operatively connected to said trigger element and operated when upon an advancing movement of the apron towards the stop means an element of the displaceable means abuts against the stop means and is displaced to cause another element thereof to move said trigger element against a force of said second spring means to release the trigger element from engagement with said opposite end of said pin whereby said first spring means urge said pin and said ball to move within said cartridge to cause the rotation of said arm, said disc and said turnable shaft therewith to uncouple the half-nuts.

4,495,844

ROTARY MICROTOME DRIVE

Brian L. Jackson, Foxelwood, Oakington, Cambridge CB4 5AR, and Philip Parker, 6 Conley Close, Ramsey, Cambridge PE17 1EL, both of England

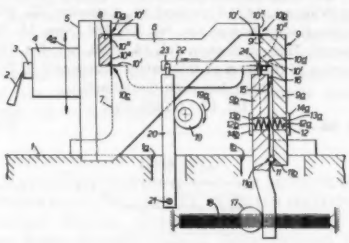
PCT No. PCT/GB81/00006, § 371 Date Sep. 15, 1981, § 102(e) Date Sep. 15, 1981, PCT Pub. No. WO81/02063, PCT Pub. Date Jul. 23, 1981
PCT Filed Jan. 16, 1981, Ser. No. 302,415
Claims priority, application United Kingdom, Jan. 17, 1980, 8001672
Int. Cl.³ G01N *1/06*
U.S. Cl. 83—715 **7 Claims**

1. An improved rotary microtome of the type in which a specimen table and a knife are mounted for relative reciprocable movement therebetween in a first direction for cutting a slice from the specimen, and for incremental movement in a second direction to incrementally advance the specimen mounted on said specimen table and said knife relative to each other, said microtome comprising,

a base,

a first link connected to said base for pivotal movement about a first hinge secured to said base for pivotal movement about a first hinge secured on said base,

a second link parallel to said first link and connected to said base for pivotal movement about a second hinge secured on said base and spaced from the first hinge,



a third link connected to said first link at a third hinge and pivotally connected to said second link at a fourth hinge,

said hinges having pivot axes parallel to each other and being located respectively at corners of a parallelogram so that pivotal movement of said first link about said first hinge in a first direction causes said third link to move parallel to a line extending through said axes of said first and second hinges, to incrementally advance the specimen and knife relative to each other, and

rotatable drive means for pivoting said first link in said first direction to cause said incremental advance.

4,495,845

PATTERN CUTTER

James E. Sherby, Wilkinsburg, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 1, 1981, Ser. No. 279,495
Int. Cl.³ B26D *3/08*
U.S. Cl. 83—886 **12 Claims**

1. An apparatus for generating a pattern in a work piece, comprising:

(a) means for supporting said work piece;

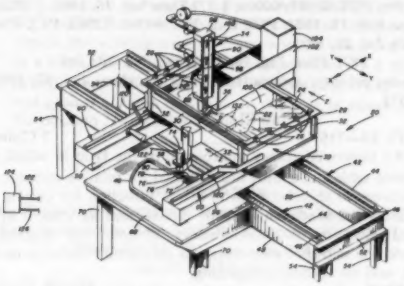
(b) disc marking means for marking said work piece;

(c) three-dimensional pattern defining means having peripheral edge portions corresponding to the edge configuration of the pattern to be generated in said workpiece;

(d) means for providing relative movement between said marking means and said supporting means along a first reciprocating path and a second reciprocating path transverse to said first path; and

(e) means responsive to said peripheral edge portions of said

pattern defining means and acting on said marking means and said providing relative movement means including means to rotate said marking means about an axis transverse to said first and said second paths and means to



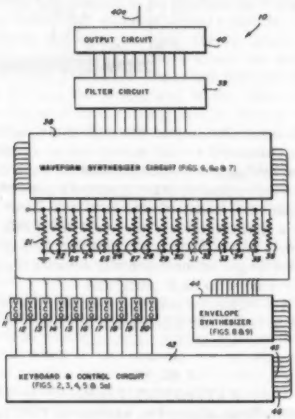
move said providing relative movement means along said first and said second paths to generate said pattern in said workpiece to be supported on said supporting means.

4,495,846

ELECTRONIC MUSICAL INSTRUMENT

S. Keith Williams, 1432 Cleveland St., Evanston, Ill. 60202

Continuation-in-part of Ser. No. 851,444, Nov. 14, 1977, abandoned. This application Jul. 14, 1980, Ser. No. 168,713
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.³ G10H *7/00*
U.S. Cl. 84—1.01 **18 Claims**



1. An electronic musical instrument comprising wave synthesis means for the production of a plurality of stepwise complex waveforms associated with a corresponding plurality of channel means associated with a corresponding plurality of frequency signals each having a rate of repetition proportional to the fundamental frequency of the corresponding said stepwise complex waveform wherein said waveform synthesis means comprises:

means for scanning said plurality of frequency signals,

means for detecting changes in state of said plurality of frequency signals from one said scan to the next,

memory means containing a plurality of step number code words associated with the corresponding said plurality of channel means, and

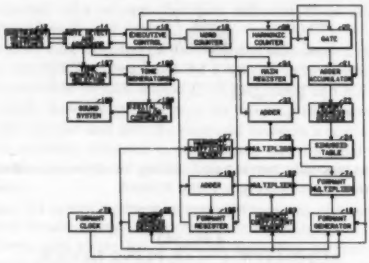
incrementer means connected in a feedback loop with said memory means.

4,495,847

COMBINED TONE GENERATION ON A SINGLE KEYBOARD FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, and Leslie J. Deutsch, Sepulveda, both of Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jun. 21, 1983, Ser. No. 506,468
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **10 Claims**



1. In a musical having a first tone generator for producing a first preselected musical tone and having a plurality of second tone generators for producing a second preselected musical tone and in which said first and second tone generators are assigned to actuated keyswitches contained in a keyboard array of keyswitches corresponding to musical notes wherein each keyswitch is operable in an unactuated or in an acutated keyswitch state, apparatus for assigning the keyboard keyswitch corresponding to the highest frequency musical note to said first tone generator and for assigning all other actuated keyboard keyswitches to corresponding ones of said plurality of second tone generators comprising;

a note detection means for detecting the keyswitch states of keyswitches in said keyboard array of keyswitches and wherein a state change signal is generated each time that a keyswitch changes its keyswitch state and wherein a new note signal is generated corresponding to each keyswitch whose keyswitch state changes from an unactuated to an actuated keyswitch state,

a high note detector which generates a high note data word identifying the keyswitch corresponding to the highest frequency of the actuated keyswitches only upon each occurrence of a said new note signal, and

an assignor means responsive to said new note signal and responsive to said high note data word whereby said first tone generator is assigned only to the keyswitch identified by said high note data word and whereby all other keyswitches in an actuated state at the time of occurence of a said new note signal are assigned only to members of said plurality of second tone generators.

4,495,848

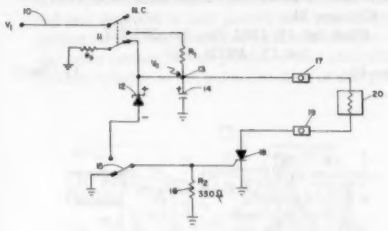
PYRO-GUN

Alexander G. Rozner, Potomac; Daniel S. Lenko, and James H. Carter, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1981, Ser. No. 285,174
Int. Cl.³ B23K *7/10*; F23Q *7/12*
U.S. Cl. 89—1.1 **9 Claims**

1. An electrically operated pyrotechnic torch comprising an igniter and power source wherein, the power source is in a first power circuit with means to control current flow to an energy storage unit including a safety feature with means to discharge

the energy storage unit to prevent inadvertent firing and a secondary circuit with an igniter in combination with means to



control flow of current to the igniter and a separate trigger circuit.

4,495,849

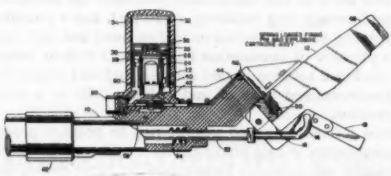
REMOTELY ACTIVATED CABLE CUTTER

Michael W. Cooke, El Cajon; Arturo Arriola, San Diego; Julius M. Stegman, Del Mar, and Kenneth D. Collins, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 424,818

Int. Cl.³ B26D *1/00*; B63B *43/00*

U.S. Cl. 89—1.14 **10 Claims**



1. An improved underwater cable cutter which can be attached by submersible vehicles, marine mammals or human divers to cables to be cut, said cable cutter having a chisel and anvil assembly whereby a chisel is activated by a spring loaded firing pin which strikes an explosive cartridge, wherein the improvement comprises:

means for holding firmly the spring loaded firing pin in a cocked postion until a later predetermined time whereat the cocked position is to be terminated thereby allowing the firing pin to strike the explosive cartridge;

means connected to the holding means for removing the holding means from holding firmly the spring loaded firing pin in a cocked position, thereby allowing the firing pin to strike the explosive cartridge;

means in contact with the removing means for controlling the activation and operation of the removing means, said controlling means being activated in response to a predetermined coded signal received at an input to said controlling means;

means for admitting the coded signal, and connected to the input of the controlling means for inputting said signal to the controlling means, said preselected coded signal originating from a distant and separate source;

means connected to the removing means, the controlling means, and the admitting means for powering them; and

means sealed to the cable cutter in a watertight manner for housing the removing means, the controlling means, and the powering means, said housing being capable of withstanding hydrostatic pressures at the depths found in the worlds oceans.

4,495,850

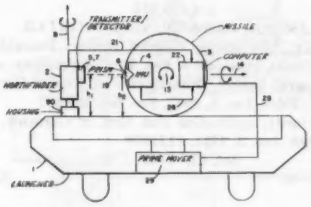
AZIMUTH TRANSFER SCHEME FOR A STRAPDOWN INERTIAL MEASUREMENT UNIT

Harold V. White, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1982, Ser. No. 411,744

Int. Cl.³ F41G *3/02*

U.S. Cl. 89—1.8 **6 Claims**



1. In a missile launching system having a launcher with a missile mounted thereon; the improvement comprising a northfinder mounted on the launcher separately from the missile; a laser diode transmitter mounted to said northfinder for transmitting a laser beam to said missile while it is located on said launcher; a beam detector mounted about said laser diode transmitter for receiving reflected energy from said laser beam; and a reflector mounted on said missile for receiving said laser beam and reflecting said beam back to said beam detector whereby the relative position of said missile and said northfinder can be determined.

4,495,851

APPARATUS FOR SETTING AND/OR MONITORING THE OPERATION OF A SHELL FUSE OR DETONATOR

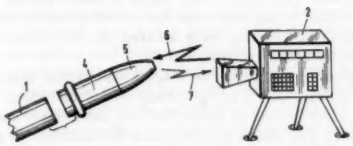
Hans-Gerhard Koerner, Schriesheim; Helmut Lang, Sandhausen; Rainer Berthold, Gaiberg; Rainer Strietzel, Heidelberg, and Friedrich Melchior, Laudenbach, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,759

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150172

Int. Cl.³ F42C *17/00*

U.S. Cl. 89—6.5 **9 Claims**



1. Apparatus for performing at least one of the functions of setting and monitoring the operation of an electronic fuse for shells to be fired from a gun, by transmitting a microwave data signal and a microwave energy signal to a device inside the fuse from a device outside the fuse, the device inside the fuse including an energy receiver with a rectifier for generating a supply voltage, a data receiver, a data processing unit and a fuse electronic system, and the device outside the fuse including an energy transmitter, an input/output unit and a data transmitter, comprising means for disposing the device outside the fuse so that the transmission of the microwave signals occurs at the latest during loading of the shell carrying the fuse into the gun; means for transmitting the energy signal and the data signal together and simultaneously; a reply signal transmitter additionally included in the device inside the fuse; a

reply signal receiver additionally included in the device outside the fuse; said data-signal transmitting means and said reply signal transmitter being actuable for transmitting and exchanging information in opposite directions; and a respective single antenna located at the fuse and at the device outside the fuse for receiving and transmitting energy, data and reply signals.

4,495,852

ARMOR CAR-MOUNTED MORTAR

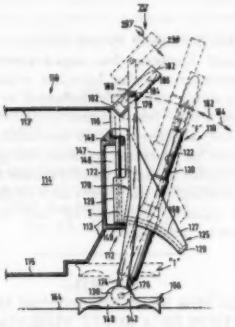
Gert Winkler, Meerbusch; Wilfried Becker, Düsseldorf, and Erich Zielinski, Haan, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 3, 1982, Ser. No. 385,007

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121998; Jun. 3, 1981, 3121999

Int. Cl.³ F41F *1/06*

U.S. Cl. 89—46 **10 Claims**



1. A weapons system comprising:

a mortar having a tube with a bore axis;

a vehicle having a body including a side wall, said sidewall having a region constructed for receiving said mortar;

means connected with said vehicle for mounting said mortar for movement between a traveling position in which said mortar is positioned to travel with said vehicle and a firing position in which said mortar is positioned to fire a projectile, said traveling position being delimited by the region provided in said side wall for receiving said mortar and said firing position being located on the ground in the vicinity of said vehicle; and

a loading rocker means for loading said mortar tube with a projectile, said loading rocker means including: a rod assembly having an upper free end and a lower end with a pivot axis; means mounting said rod assembly for pivotal movement about said pivot axis between said vehicle body and said mortar tube; and a projectile holder having a longitudinal axis and being pivotally articulated at the upper free end of said rod assembly, said projectile holder including a releasable clamping unit for releasably holding a projectile in said projectile holder; wherein said rod assembly is pivotable about said pivot axis toward said vehicle into a receiving position for insertion of a projectile into said projectile holder and said rod assembly is pivotable toward said mortar tube into a discharge position in which the longitudinal axis of said projectile holder is aligned with the bore axis of said mortar tube, and in said discharge position said clamping unit is releasable for discharging the projectile into said mortar tube, whereupon said rod assembly is immediately returnable into said receiving position.

4,495,853

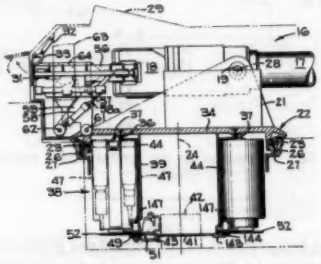
FIXED ELEVATION AUTOMATIC LOADING SYSTEM FOR FIXED AMMUNITION

Paul R. Gottwaldt, Coon Rapids, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 13, 1982, Ser. No. 397,722

Int. Cl.³ F41H *7/06*

U.S. Cl. 89—46 **11 Claims**



1. An automatic loading system for moving large caliber fixed ammunition within a turret which is rotatable about an azimuth axis relative to a support structure and which has a gun barrel mounted there for movement in elevation relative thereto, comprising

an ammunition storage ring disposed in the turret and rotatable about an axis substantially parallel to the azimuth axis, said storage ring including a carousel, and a plurality of rotating drums mounted on said carousel and each having a plurality of ammunition holding cells therein, whereby combined rotation of said carousel and said drums brings predetermined ones of said holding cells to a transfer position,

means for indexing said storage ring to position predetermined ones of said holding cells at said transfer position,

a transfer tray assembly mounted on the turret having means to receive, engage and discharge fixed ammunition rounds,

means for moving said transfer tray assembly between said transfer position wherein an ammunition round may be moved between a holding cell and said tray and a predetermined elevation position aligned with the gun breech, whereby an ammunition round may be moved between said tray and the breech of the gun barrel when the barrel is at said predetermined elevation relative to the turret,

means for moving ammunition rounds into and out of said transfer tray,

means for receiving from the breech and discharging spent ammunition round cases, and

means for controlling actuation of said means for indexing, means for moving said transfer tray, means for moving ammunition rounds, and means for receiving and discharging spent cases in appropriate sequence to operate the system in a selected mode.

4,495,854

POWER SERVO BOOSTER

Sadanobu Hibino, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 153,294, May 27, 1980, abandoned. This application Nov. 29, 1982, Ser. No. 444,916

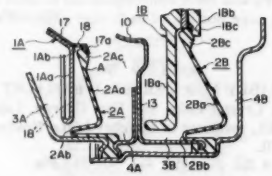
Claims priority, application Japan, Jul. 11, 1979, 54-87589

Int. Cl.³ F01B *19/00*

U.S. Cl. 91—438 **2 Claims**

1. A power servo booster comprising a shell, at least one power piston and at least one diaphragm operatively disposed within said shell, said piston and diaphragm cooperating to divide said shell into at least one negative pressure chamber and at least one atmospheric pressure chamber, a supporting

plate coupled to one side of the piston, said supporting plate having an outer peripheral end portion extending substantially radially outwardly to define an annular groove with a surface of said piston, said diaphragm having a thickened inner peripheral end disposed in said groove and having an arcuate edge surface on the side thereof toward said surface of said piston, said outer peripheral end portion of said plate being inclined at an angle relative to the radial direction of said piston in a range



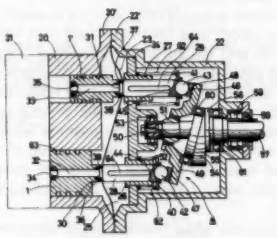
from 10° to 45° whereby said inner peripheral end of said diaphragm can freely pivot in said annular groove so that said diaphragm is not caused to bend in the vicinity of said inner peripheral end during a vacuum pressure failure in order to prevent said diaphragm from folding and collapsing during said vacuum pressure failure and a communication hole disposed in said supporting plate to provide communication between said chambers upon pivoting of said inner peripheral end of said diaphragm in said annular groove.

4,495,855

RECIPROCATING TYPE OIL-FREE GAS COMPRESSOR

Muneo Murakami, Nishinomiya, and Zentaro Ishizaki, Kamakura, both of Japan, assignors to Showa Precision Machinery Co., Ltd., Amagasaki and Kabushiki Kaisha Ecti Kenkyusho, Kamakura, both of, Japan

Filed Dec. 9, 1983, Ser. No. 562,242
Claims priority, application Japan, May 31, 1983, 58-97520
Int. Cl.³ F01B *3/02*
U.S. Cl. 92—71 **4 Claims**



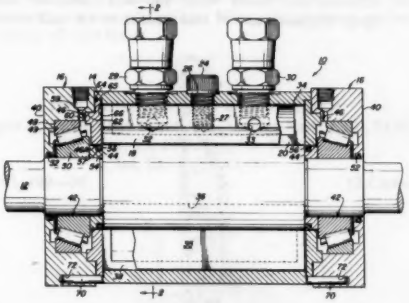
1. In a multistage gas compressor in which cylinders having a plurality of compression pistons are connected to a transmission case, an oil-free gas compressor characterized in that guide pistons for imparting reciprocating movements to these compression pistons are respectively connected in series to said compression pistons, a common space where these pistons come in and out is defined adjacent the connections, and a single diaphragm is installed in said space, said diaphragm oil-tightly separating said compression pistons from said guide pistons.

4,495,856

ROTARY ACTUATOR

Phillip Sollami, P.O. Box 627, R.R. 2, Weaver Rd., Herrin, Ill. 62948

Filed Nov. 7, 1983, Ser. No. 548,950
Int. Cl.³ F01C *9/00*
U.S. Cl. 92—125 **12 Claims**



1. A fluid operated, reciprocatory rotary motor, comprising in combination,

a body having a cylindrical bore therein,

first and second head assemblies fixedly mounted to said body over the respective ends of said bore,

a shaft extending through said bore and through said head assemblies,

a radially disposed, longitudinal stator mounted in said body between said head assemblies,

first and second annular thrust bearings respectively disposed in said first and second head assemblies, said shaft being journalled in said bearings,

a radially disposed, longitudinal vane fixedly mounted to said shaft and extending from said first head assembly to said second head assembly,

first sealing means carried by said stator for sealing said stator to said shaft and to said head assemblies,

second seal means carried by said vane for sealing said vane to said body and to said head assemblies, and

means for admitting fluid under pressure into said bore to one side or the other of said stator,

said first head assembly including a head member having a central bore and a counterbore through which said shaft extends,

an annular thrust bushing compressed between an annular shoulder on said shaft and said first thrust bearing

an annular end plate compressed between an annular end surface of said body and an annular facial surface on the inner side of said head, the radius of said facial surface being less than the radius of said annular end surface, and

an annular sealing member compressed between said thrust bushing and the inner diameter of said end plate.

4,495,857

LABYRINTH VENTILATOR

Paul E. Morgan, Bridgewater, N.J., assignor to CTI International Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 286,854, Jul. 27, 1981, abandoned. This application Apr. 23, 1984, Ser. No. 602,913
Int. Cl.³ B60H *1/24*
U.S. Cl. 98—6 **11 Claims**

1. A labyrinth ventilator to be placed upon the sidewall of a container at the site of at least one air breather opening in the sidewall, said ventilator being formed as a unitary structure comprising:

a housing having a front wall and a perimetric wall extending from a periphery of said front wall towards an open

rear portion of said housing, there being a set of air inlet apertures disposed in said perimetric wall and extending transversely along a bottom of said housing;

a set of baffles including a lower baffle and an upper baffle extending transversely within said housing from one side of said housing to the opposite side of said housing, said lower baffle extending from said front wall part way toward said rear portion to provide a space for air flow between said lower baffle and said container sidewall upon emplacement of said ventilator on said container

sidewall, said upper baffle having an air-flow opening at said front wall, said upper baffle extending to said rear portion to block a flow of air along said container sidewall, thereby to provide a sinuous path to airflow;

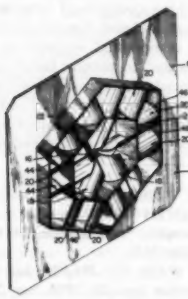
means for securing said ventilator to said container sidewall; and wherein the extension of each of said baffles toward said open rear portion is in a direction sufficiently close to a normal to said front wall to permit said baffles and said housing to be formed integrally in a single molding operation.

4,495,858

FIXED BLADE AIR BLENDER APPARATUS

Donald P. Erickson, Arvada, Colo., assignor to Rocky Mountain Sheet Metal Company, Inc., Denver, Colo.

Filed May 7, 1982, Ser. No. 376,253
Int. Cl.³ F24F *13/04*
U.S. Cl. 98—38.1 **16 Claims**



1. Air mixing apparatus adapted for intermixing airstreams of different temperatures flowing through a common passage, comprising:

an outer enclosure traversing said passageway;

a central hub; and

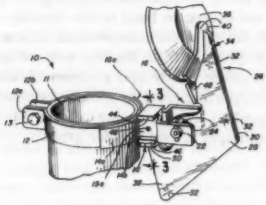
a plurality of radially extending vanes diverging away from said hub and terminating at their outer distal ends adjacent to said outer enclosure, each of said vanes including a straight leading edge portion across its length extending rearwardly in the direction of air flow and curving laterally into a straight trailing edge at a uniform acute angle along its length to the direction of air flow through said flow passageway, and an inner convergent end on each vane tapering forwardly and inwardly from said trailing edge to said leading edge and terminating at said central hub, each said convergent end defining a lateral clearance space between said inner convergent end of each vane and said leading edge portion of each next adjacent vane.

4,495,859

COVER ASSEMBLY FOR VERTICAL EXHAUST PIPES

Edwin R. Janke, Crystal Lake, and Earl Conrad, Lake in the Hills, both of Ill., assignors to Mercury Metal Products, Inc., Schaumburg, Ill.

Filed Jul. 25, 1983, Ser. No. 516,678
Int. Cl.³ F01N *7/00*; **F23L** *17/02*
U.S. Cl. 98—59 **12 Claims**



1. A gravity actuated protective cover assembly adapted to be secured upon the upstanding exhaust stack of an internal combustion engine to prevent entry of extraneous matter therein through the open end thereof during the inoperative condition of the engine and comprising:

A. a clamp member adapted to be secured to the exhaust stack and including clamping means therefor;

B. a pair of separate support straps, means fixedly connecting said straps to said clamp member, said straps extending laterally from the clamp member in transversely spaced apart relationship to each other for the full extent of said straps laterally of said clamp member, the support straps having a pivot structure mounted thereon;

C. a balance arm mounted on said pivot structure for pivotal movement about said pivot structure in a vertical plane, the balance arm having a cover member connected to a front end thereof and an opposing counterweight vane, the vane and cover member being on respective opposite sides of the pivot structure to enable pivotal movement of the balance arm between a first position which is to dispose the cover member over the open end of the exhaust stack, and a second position having the cover member substantially rotated away from the stack to expose said open end;

D. the balance arm being heavier on the cover member side of the pivot structure than on the vane side of the pivot structure so that the normal condition of the balance arm is with the cover member in the first of said positions when the engine is not operating;

E. said straps including flange portions spaced apart to form a bifurcated end formation in which the pivot structure is mounted with said balance arm straddled by said flanged portions, said straps further including spaced opposing neck formations between said end formation and said clamp member, said neck formations defining a space therebetween and having bumper means mounted thereon for limiting said pivotal movement and preventing en-

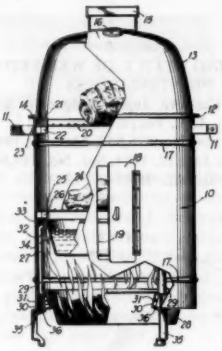
gagement of said cover member with the open end of the stack.

4,495,860

FOOD GRILLING, ROASTING, SMOKING AND STEAMING APPARATUS

Robert J. Hitch, and Mason Holland, both of Columbus, Ga., assignors to W. C. Bradley Enterprises, Inc., Columbus, Ga.

Filed Mar. 8, 1984, Ser. No. 587,553
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—340 **7 Claims**



1. A cooking apparatus comprising a shell having lifting handles, a removable dome for the shell, spaced superposed food racks liftably positioned within the shell, the shell having an upright axis in use and being open-ended, and a coacting charcoal pan and water pan assembly including support legs to which a charcoal pan is fixed and upon which a water pan is freely liftably mounted in spaced superposed relationship to the charcoal pan, said charcoal pan and water pan assembly being free-standing, and the legs of said assembly having support shoulders upon which the shell may rest and be supported with its lower portion in surrounding relationship to said charcoal and water pans and with a lowermost food rack of the shell disposed near and above the top of the water pan, said shell and food racks being liftable as a unit from the charcoal pan and water pan assembly to fully expose the latter.

4,495,861

COOKING UTENSIL

Shirley L. Jacks, 109 Arroyo Dr., Danville, Calif. 94526, and Sun W. Ng, 18 Barcelona Ave., San Francisco, Calif. 94115

Filed Oct. 24, 1983, Ser. No. 544,626
Int. Cl.³ A47J *37/06*
U.S. Cl. 99—422 **12 Claims**

1. A cooking utensil for use on a barbeque-type device which includes a bowl for containing a heating medium, comprising:

means defining a generally planar, substantially imperforate cooking surface having peripheral dimensions less than the cross dimensions of the upper rim of said bowl to define a space about the periphery of the cooking surface and the upper rim of the bowl for air circulation to the heating medium; and

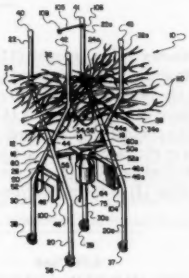
handle mans projecting outwardly from the periphery of the cooking surface means a sufficient distance for supporting said cooking surface means on the rim of said bowl and beyond said rim to facilitate lifting the cooking surface means off said bowl.

4,495,862

LIMB BUNDLER AND BAG HOLDER

Douglas A. Davis, 6664 Royer Ave., Canoga Park, Calif. 91307

Filed Sep. 19, 1983, Ser. No. 533,289
Int. Cl.³ B65B *13/00*
U.S. Cl. 100—34 **13 Claims**



1. A trash bundler and collector comprising:

a frame member further comprising:

a pair of leg assemblies, each including a pair of legs, each said leg having a top and a bottom end;

structural means interconnecting said bottom ends of each said pair of legs;

pivot means intermediate said ends and interconnecting said legs in each said leg assembly with said legs in the other said leg assembly, fixing the relative positions of said leg assemblies and facilitating relative pivotal movement therebetween; and

latch means for interconnecting and further securing said pair of legs in each said assembly against movement relative to the other said pair of legs.

4,495,863

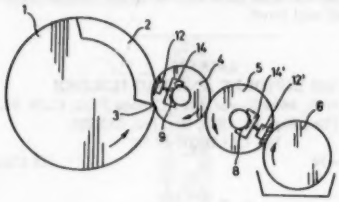
ARRANGEMENT FOR PREVENTION OF ROLLER MARKS ON ROLLER UNITS IN A PRINTING PRESS

Janko Despot, and Paul Abendroth, both of Offenbach am Main, Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,592
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211154
Int. Cl.³ B41F *31/30*
U.S. Cl. 101—350 **2 Claims**

1. In a rotary printing machines having a plate cylinder (1), a frame (7), and arrangement for mounting to the frame (7) an applicator roller (4) for applying fluid to the plate cylinder (1) and a preceding roller (5) in a fluid feed system (6,5,4,1) for applying fluid to the applicator roller (4), and said plate cylinder being journalled to said frame without substantial bearing play and being formed with a recessed gap (2) over a segment of its outer periphery which defines a leading plate cylinder edge (3) which cyclically engages the applicator roller (4), wherein the improvement comprises means for preventing undesirable roller marks in the fluid applied to the plate cylin-

der upon cyclic engagement of the leading edge of the plate cylinder with the applicator roller, said means including means mounting the applicator roller and preceding roller for movement toward and away from the plate cylinder, said means mounting consisting of journal means for each of said rollers, each of said journal means having substantial bearing play, a pressure plate (14) acting on the bearing journal (11) of the applicator roller (4) under the force of a first spring (13) to



force the applicator roller journal (11) toward the bearing surface away from the plate cylinder (1), and a pressure plate (14') acting on the bearing journal (10) of the preceding roller (5) under the force of a second spring (13') to urge the preceding roller (5) into contact with the applicator roller (4) so as to prevent excessive increases in pressure between the applicator roller (4) and preceding roller (5) upon said cyclic engagement of the leading edge (3) of the plate cylinder (1) with the applicator roller.

4,495,864

INK KNIFE AND ADJUSTING DEVICE THEREFOR ON AN INK DUCT OF A ROTARY PRINTING MACHINE

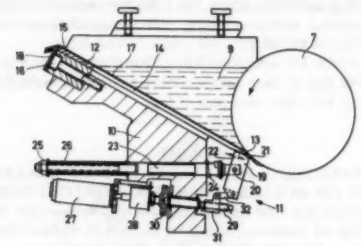
Rudi Junghans, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Feb. 2, 1983, Ser. No. 463,330

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203500

Int. Cl.[3] **B41F** *31/04, 31/06;* **B41L** *27/06*

U.S. Cl. 101—365 **8 Claims**



1. In an ink duct assembly of a rotary printing machine having an ink duct formed with an ink duct roller, the improvement therein comprising an ink knife having a wiper edge and being divided into individually controllable zone-wide tongues in vicinity of said wiper edge, and adjusting means for adjusting a gap width between said wiper edge and said ink duct roller, said tongues having slits therebetween which are very narrow compared to the width of said tongues, said tongues being positionable by said adjusting means starting from a uniform zero position, and said tongues being covered with an elastic covering formed of a thin, hard and elastic foil having a smooth surface and having a part thereof overlapping said wiper edge and engaging tangentially with said ink duct roller, said elastic covering, at a forward region thereof, being bent at an angle towards said ink duct roller so as to wipe excessive ink emerging from the ink duct onto said wiper edge back onto an ink film on said ink duct roller.

4,495,865

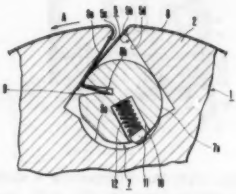
PLATE CLAMPING DEVICE OF WEB-FED ROTARY PRINTING PRESS

Hiroyoshi Kamoda, Kashiwa, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 475,537, Mar. 15, 1983,. This application Jun. 11, 1984, Ser. No. 619,682

Int. Cl.[3] **B41F** *27/12*

U.S. Cl. 101—415.1 **3 Claims**



1. A device for clamping a printing plate having first and second ends adapted to be held by clamping means on a web-fed rotary printing press comprising:

a plate cylinder, said plate cylinder being provided with a longitudinal slot having a narrow opening on a peripheral surface of said plate cylinder, said slot having a cross section formed by a semicircular bottom surface, outward diverging surfaces extending from the edges of said semicircular bottom and first and second oppositely inclined converging plane side walls interconnecting opposite edges of said opening and said diverging surfaces;

a round plate clamping shaft in said slot sized to provide substantial clearance from the inner walls of said slot thereby to loosely fit into said slot beneath the peripheral surface of said plate cylinder, said plate clamping shaft having: a plurality of radially projecting spring loaded balls contacting said semicircular bottom to urge said shaft against said converging side walls as said shaft is rotated each of said balls being partially contained in an opening in said shaft, a peripheral surface including a flat surface generally parallel to the radial direction of movement of said spring loaded balls, the flat surface in a first position of rotation of said shaft allowing space for said first end of said printing plate to being inserted between said first side wall and said shaft, and a groove in said shaft opposed to said opening when said shaft is in said first position for receiving said second end of said printing plate;

wherein for said first position said spring loaded balls urge said plate clamping shaft against said second side wall to provide said space for said first end of said printing plate to be inserted between said first side wall and the flat surface of said shaft, and

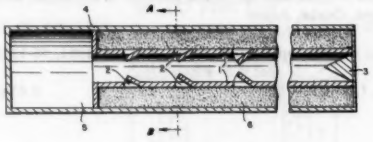
wherein for a second position of rotation of said shaft said spring loaded balls urge said plate clamping shaft against both said first and second walls to hold both ends of said printing plate securely between said first side wall and said shaft.

4,495,866

FLASH GUIDE TUBE ARRANGEMENT FOR PROPELLANT CHARGE IGNITERS

Uwe Brede, Furth; Günter Hübsch, Kalchreuth, and Rudolf Stahlmann, Furth, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,185
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151673
Int. Cl.³ F42C *19/08*
U.S. Cl. 102—202 9 Claims



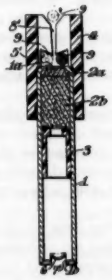
1. A flash guide tube arrangement for propellant charge igniters for ammunition comprising an elongated tube having front and rear ends and lateral openings for the exiting of ignition gases, and axially arranged indentation means of the flash guide tube emanating from and adjoining the openings, the indentation means projecting inwardly toward the interior of the flash guide tube with the individual indentation means having a depth which decreases in the direction toward the rear end of the flash guide tube.

4,495,867

ASSEMBLY FOR INITIATING EXPLOSIVES WITH LOW-ENERGY DETONATING CORD

Hardin D. Mitchell, Jr., Monument, Colo., and Malak E. Yunan, Boonton Township, Morris County, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1982, Ser. No. 389,621
Int. Cl.³ C06C *5/00*
U.S. Cl. 102—275.4 33 Claims



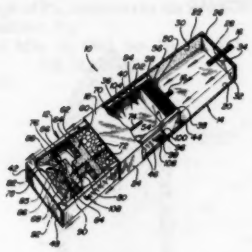
26. A cord/initiator connector comprising a plastic tube having, at one end thereof, a transverse slot communicating with its bore and adapted to engage a length of LEDC, and its opposite end surface being tapered to form a package-piercing spike of sufficient length to protrude beyond the end of an initiator shell which said tube is adapted to hold, said tube being provided with retaining means adjacent said transverse slot for preventing the disengagement of a length of LEDC therefrom.

4,495,868

SAFE FIRECRACKER

Johnnie V. Matthews, P.O. Box 1171, East Orange, N.J. 07018

Filed Feb. 16, 1982, Ser. No. 348,920
Int. Cl.³ F42B *4/04, 4/22, 4/24*
U.S. Cl. 102—357 13 Claims



7. A firecracker assembly comprising:

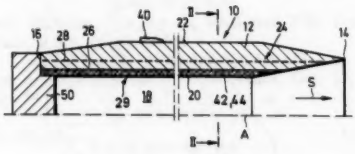
a casing member; and a firecracker member positioned in said casing member, said firecracker member including a first powder portion and a first fuse attached thereto extending to the exterior of said casing member, a second powder portion and a second fuse attached thereto, and a first chamber having a container member containing a liquid for soaking said second powder portion and said second fuse upon release of the liquid from the container member.

4,495,869

FUZELESS ANNULAR WING PROJECTILE

Bernhard Bisping, Ratingen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,452
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111725
Int. Cl.³ F42B *13/18, 13/00*
U.S. Cl. 102—503 8 Claims



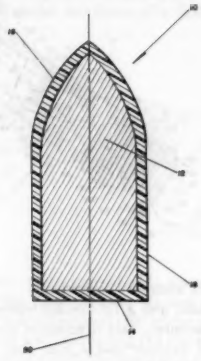
1. A fuzeless annular wing projectile comprising: a tubular projectile body having smooth interior and exterior cylindrical faces extending in the longitudinal direction of said body; and a guide band mounted on said body; said body having recesses which reduce the thickness of said body and constitute desired break locations in the region of at least one of said faces and at least at a location between the front end of said body and the location of said guide band; and wherein said body further comprises a hardened plastic material filling said recesses in order to give said one face a smooth form, and at least one metallic component embedded in said plastic material and made of a metallic material selected from among magnesium, zirconium, or depleted uranium.

4,495,870

EXTERNAL TRACER FOR GUN LAUNCHED PROJECTILES

Frank H. Bell, Logan, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Aug. 2, 1982, Ser. No. 403,980
Int. Cl.³ F42B *11/20, 11/16*
U.S. Cl. 102—511 **5 Claims**



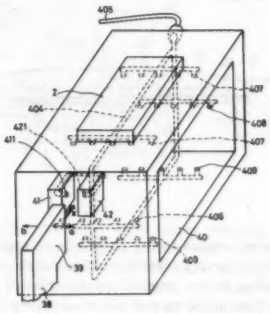
1. An external burning tracer-type projectile comprising:
a metallic core, and
a tracer composition jacket completely encasing said core, said jacket being composed of a combustible mixture of fuel and oxidizer, said oxidizer serving also as a lubricant upon firing of the projectile from the rifle barrel of a gun for reducing the bore friction.

4,495,871

TABLE SLIDING APPARATUS

Keiji Nagata, Hirakata City; Syuji Ueda, Neyagawa City, and Yoshiyuki Tanigawa, Hirakata City, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 29, 1982, Ser. No. 403,150
Claims priority, application Japan, Aug. 11, 1981, 56-125659
Int. Cl.³ A47B *85/00*
U.S. Cl. 108—20 **3 Claims**



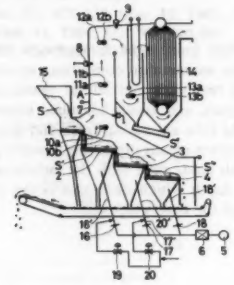
1. A table slider apparatus comprising:
a sliding table slidably held in a predetermined direction along a guide block by a sliding bearing on a guide block,
a driving screw rod which is driven to rotate around its axis by a motor, the axis being in a direction parallel to said predetermined direction,
a moving bracket having a driven screw hole with a female screw thread and screw-engaged on said driving screw rod by the driven screw hole,
a guide means which holds said moving bracket in sliding relation in the direction parallel to said predetermined direction, and
an elastic coupling means for coupling said moving bracket in elastic relation with said sliding table.

4,495,872

INCINERATOR AND METHOD OF REDUCING NO_x EMISSIONS

Masanobu Shigaki, Ibaragi, Japan, assignor to Kabushiki Kaisha Takuma, Osaka, Japan

Filed Feb. 27, 1984, Ser. No. 584,221
Claims priority, application Japan, Aug. 28, 1981, 56-135970
Int. Cl.³ F23N *5/02*
U.S. Cl. 110—190 **4 Claims**



1. An incinerator comprising:
stoker means comprising at least three stokers. said stokers including an ignition stoker, a gas generation stoker, and a complete combustion stoker, said stokers being installed within said incinerator to have stoker surfaces of successively lower elevations;
a combustion chamber positioned above said stokers;
means for selectively communicating heated air to each of said stokers;
detector means proximate said stoker means for detecting temperature and analyzing gas constituency;
means for controlling the communication of heated air to each of said ignition and gas generation stokers whereby said ignition and gas generation stokers are supplied with an amount of air less than the amount of air theoretically required for essentially complete combustion of refuse on said stokers;
means for selectively controlling the communication of heated air to said complete combustion stoker whereby said complete combustion stoker is supplied with an amount of air greater than the amount of air theoretically required for the essentially complete combustion of refuse on said stoker;
a plurality of further detector means for detecting temperature and analyzing gas constituency, said further detector means being positioned in said combustion chamber at successive points along the flow route of combustion gas inside said combustion chamber;
a plurality of nozzle means for introducing air into said combustion chamber, the introduction of air through said nozzle means being controlled by signals produced by said further detector means whereby the gas generated at said stoker means is combusted in said combustion chamber at a temperature below a predetermined temperature;
means for selectively communicating steam to said ignition stoker and to said gas generation stoker; and,
means for controlling the communication of steam to each of

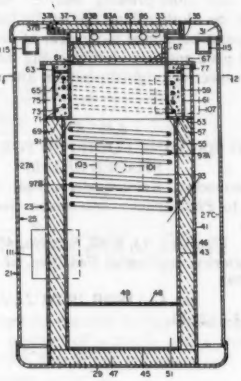
said ignition and gas generation stokers, said control means operatively connected to and responsive to signals produced by said detector means proximate said stoker means.

4,495,873

INCINERATOR FOR BURNING ODOR FORMING MATERIALS

Ernest B. Blankenship, Dallas, Tex., assignor to Research Products/Blankenship Corporation, Dallas, Tex.

Filed Jul. 26, 1983, Ser. No. 517,285
Int. Cl.³ F23G *3/04*
U.S. Cl. 110—250 **15 Claims**



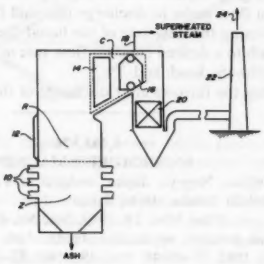
1. An incinerator apparatus, comprising:
an inner housing located within an outer housing,
said outer housing having an upper opening adapted to be closed with an insulated outer housing closure means,
said inner housing having an upper opening adapted to be closed with an insulated inner housing closure means,
said inner housing having its side wall spaced from the side wall of said outer housing,
said inner housing defining a central chamber extending from its upper opening to a lower position for receiving material to be burned,
the upper portion of said central chamber having an inner perforated wall,
a second perforated wall surrounding said inner perforated wall defining a surrounding chamber for holding an odor reducing heat activated catalyst,
a surrounding wall spaced from and surrounding said second perforated wall defining a surrounding gas collection chamber,
first exhaust means in fluid communication with said collection chamber for exhausting gas from said central chamber by way of said heat activated catalyst and said collection chamber to the interior space of said outer housing between said inner housing and said outer housing,
second exhaust means in fluid communication with the interior space of said outer housing for exhausting gas therein to the atmosphere,
first electrical heating means for preheating said odor reducing catalyst,
the lower portion of said side wall of said inner housing comprising insulating material,
second electrical heating means located in a combustion portion of said central chamber below said first electrical heating means for incinerating material deposited therein,
air inlet means formed through the side wall of said inner housing, and
blower means for forcing air within said interior space of said outer housing into said combustion portion of said chamber by way of said inlet means.

4,495,874

COMBUSTION OF HIGH ASH COALS

Eugene J. Greskovich, Allentown, and Walter A. Zanchuk, Walnutport, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 18, 1983, Ser. No. 495,868
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **15 Claims**



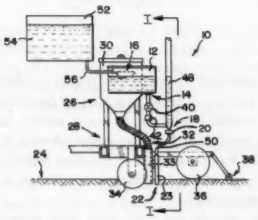
1. A method for combusting high ash content coal in a furnace comprising a firebox and at least one injection nozzle having a bore for a primary airstream and an annular passage for a secondary airstream, the nozzle communicating with the firebox, which method comprises:
(a) injecting a primary airstream containing a pulverized coal which is at least 7 wt % ash and a secondary airstream through the injection nozzle into the flame zone of the furnace firebox and combusting the coal to yield a flame of combustion, and
(b) injecting a sufficient amount of oxygen into the secondary airstream such that an oxygen enriched secondary airstream emanates from the injection nozzle and the oxygen concentration of the combined primary and secondary air streams is 22 to 25 vol %, whereby the amount of ash fines less than one micron in diameter is reduced.

4,495,875

ADMINISTERING OF AGRICULTURAL CHEMICALS IN LIQUID FORM

Andrew E. Makkink, P.O. Box 14, Sannieshof, 2760, Transvaal Province, R.S.A., South Africa

Filed Sep. 21, 1982, Ser. No. 420,657
Claims priority, application South Africa, Oct. 23, 1981, 81/7370
Int. Cl.³ A01C *3/00*
U.S. Cl. 111—7 **5 Claims**



1. A method of administering at least one agricultural chemical in liquid form to an agricultural land, the method comprising

providing at least one supply of said at least one liquid chemical at an elevation position above the agricultural land;

causing said at least one supply of said at least one liquid chemical to traverse the agricultural land;

opening the surface of the agricultural land to create a plurality of laterally spaced furrows selectively at desired different depths while traversing the agricultural land;

permitting the liquid chemical to flow under gravity to the agricultural land;

maintaining the hydraulic head of the liquid chemical at a substantially constant level while outflow is taking place;

guiding the liquid chemical flowing under gravity via different flow paths to discharge into said furrows;

restricting the flow rate of the liquid chemical in each flow path to a desired constant flow rate in dependence on the hydraulic head; and

closing the furrows after discharge of the liquid chemical.

4,495,876

EMBROIDERY MACHINE

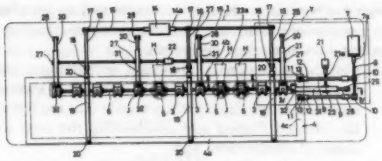
Ikuo Tajima, Nagoya, Japan, assignor to Tokai Kogyo Mishin Kabushiki Kaisha, Aichi, Japan

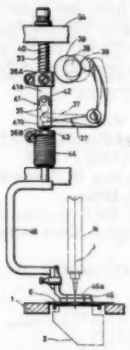
Filed Mar. 24, 1983, Ser. No. 478,354

Claims priority, application Japan, Apr. 8, 1982, 57-60213; Apr. 10, 1982, 57-60048; Apr. 19, 1982, 57-65991

Int. Cl.³ D05C *9/04*

U.S. Cl. 112—103 **4 Claims**





1. An embroidery machine having a table on which a cloth is spread to be fed, and a plurality of heads disposed above said table in parallel relation to each other, each of said heads having a needle for forming embroidery stitches on said cloth, said needle having an axis of rotation which is the origin of the X and Y axes of the Cartesian coordinates with respect to said table, comprising:

a frame placed on said table and means for horizontally moving said frame in the directions of said X and Y axes in response to signals produced by a control unit for feeding the cloth;

a feed plate provided horizontally under the cloth and means for moving said feed plate horizontally in the direction of movement of said frame and for returning said feed plate independently to its original position; and

a cloth-pressing member surrounding said needle and means for vertically moving said cloth-pressing member for selective cooperating with said feed plate so as to tightly hold the cloth around the needle location therebetween, and means for allowing movement of said cloth-pressing member horizontally in any direction around said needle and for returning said cloth-pressing member independently to its original position;

wherein said feed plate and said cloth-pressing member, when said frame moves horizontally, synchronously moves in the same direction where said frame moves; and

wherein said cloth-pressing member moves upwardly to release the cloth around the needle location prior to the subsequent horizontal movement of said frame; and

said feed plate and said cloth-pressing member returning to their respective original positions after a stitch is made.

4,495,877

SEWING MACHINE EQUIPPED FOR PRODUCING SHAPED SEAMS

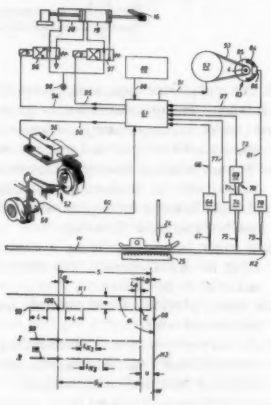
Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jan. 13, 1983, Ser. No. 457,648

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216993

Int. Cl.³ D05B *19/00, 27/22*

U.S. Cl. 112—121.11 **11 Claims**



1. In a sewing machine having a needle with drive means for driving the needle, feed means for feeding a workpiece having a guiding and a trailing edge extending at an angle relative to each other, a setting device for setting the feed means, and means for producing shaped seams having a first sensor which is positioned ahead of the needle in a feed direction of the workpiece for sensing the trailing edge of the workpiece, a pulse generator coupled to a main shaft of the sewing machine, and a program controlled switching circuit by which the sewing machine is stopped at a predetermined end point in response to pulses issued from the sensor and the pulse generator, the improvement comprising: sensing means for determining an actual feed distance; and setting means associated with the switching circuit and the setting device for controlling the setting device in response to a determined difference amount between a desired and the actual feed distance and an angular position of the main shaft at an instant of response of the first sensor, which angular position corresponds to a displacement of the feed means, said setting means being operable to adjust

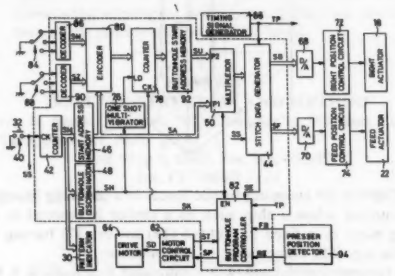
the setting device to form stitches of various lengths from zero to a maximum stitch length.

4,495,878

ELECTRONIC SEWING MACHINE

Yoshimi Asai; Michitaka Takiguchi, and Fujio Horie, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 16, 1983, Ser. No. 494,681
Claims priority, application Japan, Jun. 1, 1982, 57-93657
Int. Cl.[3] D05B *3/08*
U.S. Cl. 112—158 B **6 Claims**



1. An electronic sewing machine having actuating means for varying a relative position of a needle and a workpiece in accordance with stitch data which influences each stitch of a buttonhole, comprising:

manual means for setting the thickness of thread;

means for generating a thread code signal representative of the thread thickness set by said manual means;

means responsive to said thread code signal for designating one of plural buttonholes each of which has a circular stitching part at its end and corresponds to each of different thicknesses of various threads to be used, said buttonholes being different in the number of stitches to be formed in said circular stitching part to maintain a constant thread density; and

data generating means capable of selectively generating one of plural different groups of stitch data which respectively correspond to said plural buttonholes, said data generating means operating in timed relation with reciprocation of said needle for supplying said actuating means with each stitch data of the group corresponding to the designated buttonhole.

4,495,879

METHOD AND APPARATUS FOR PRESSING SEAMS OPEN ON SEWING MACHINES

Toshiki Yamamoto, Uchida Higashi-cho 4-7, Inuyama-shi, Aichi-ken 484, Japan

Filed Mar. 21, 1983, Ser. No. 477,275
Claims priority, application Japan, May 10, 1982, 57-078961
Int. Cl.[3] D05B *29/00, 1/02, 35/02;* D06F *71/30*
U.S. Cl. 112—217 **8 Claims**

1. A method of pressing open a sewn seam of upper and lower fabric pieces on a sewing machine, comprising the steps of:

separating the upper and lower fabric pieces by means of a presser foot;

sewing the upper and lower fabric pieces along a seam with respective edges left along said seam;

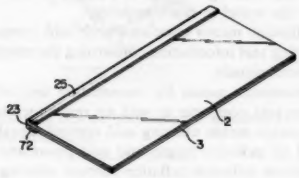
feeding the upper and lower fabric pieces in a specific direction on a main feed dog;

folding back the edge of the upper fabric piece on the latter by means of a guide member disposed above a throat plate;

heating the guide member to heat the seam;

folding back the edge of the lower fabric piece on the latter below the throat plate by means of a guide rod mounted on the throat plate;

lifting the folded edge of the lower fabric piece up to the throat plate by means of an auxiliary feed dog;



guiding the folded edge of the lower fabric piece onto a bearing plate by means of a guide body movable with the main feed dog; and

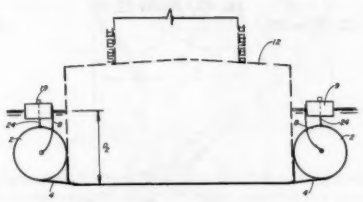
pressing the upper and lower fabric pieces with their folded edges with heat between a roller and the bearing plate while rotating the roller to move the upper and lower fabric pieces in said direction.

4,495,880

DRAFT ASSISTED DELIVERY SYSTEM

Philip M. Maniscalco, New Orleans, La., and Frank Marino, Sands Point, N.Y.

Filed May 19, 1982, Ser. No. 379,940
Int. Cl.[3] B63B *35/42*
U.S. Cl. 114—123 **29 Claims**



1. A draft assisted delivery system for reducing the draft of a marine vessel, comprising:

a. at least one control tender vessel disposed adjacent to the marine vessel;

b. air supply means associated with said control tender vessel(s);

c. air regulator means associated with said air supplying means;

d. a computer associated with said air regulator means;

e. at least one inflatable/deflatable module, each module having two, laterally opposed, inflatable/deflatable pneumatic lift cells with a base extending under the vessel connecting said inflatable/deflatable pneumatic lift cells together;

f. a plurality of surface floating containers disposed above said module(s);

g. a plurality of positioning means mounted on said floating containers for positioning said module(s) about the marine vessel;

h. a plurality of air delivery means emanating from said air supplying means connected to said pneumatic lift cells for facilitating the inflation/deflation thereof;

i. float/module connection means associated with said positioning means on said floatable containers and said modu-

le(s) for connecting said floating containers to said module(s); said connection means including support means being tautly attached from each floating container to each module below each of said containers for maintaining each said floating container in a relatively fixed position above each said module;

i. information-transmitting means associated with the system for transmitting relevant hull aspect information concerning the vessel to said computer;

k. utilization means associated with said computer for converting said information concerning the marine vessel into control signals;

l. transmission means for transmitting said control signals from said computer to said air regulator means, said air regulator means utilizing said control signals to regulate said air delivery means into said pneumatic lift cells, to facilitate inflation/deflation thereof, altering the draft of the marine vessel while simultaneously minimizing any full aspect difficulties of the marine vessel;

m. incoming vessel basepoint grid means initially associated with the vessel for initially receiving the marine vessel for draft reducing engagement with said module(s); and

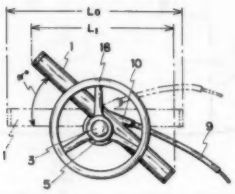
n. departure basepoint grid means subsequently associated with the marine vessel located a distance away from said incoming basepoint grid means for receiving the marine vessel for disengagement from said module(s).

4,495,881

BOAT STEERING MECHANISM

Makoto Teraura, Takarazuka, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed May 16, 1983, Ser. No. 495,112
Claims priority, application Japan, Jul. 5, 1982, 57-117089
Int. Cl.³ B63H *25/10*
U.S. Cl. 114—159 **3 Claims**



1. A boat steering mechanism for controlling a remotely mounted rudder by means of a push-pull control cable having an outer casing and an inner cable which is slidably pushed and pulled in said outer casing, comprising

(a) a pinion attached to a steering shaft;

(b) A linear rack having teeth meshing with teeth of said pinion and being formed with a longitudinal groove for receiving said inner cable;

(c) a rack casing into which said linear rack is slidably inserted;

(d) a projection projecting from the center or its vicinity of said rack casing, and a member on the top end of said projection for fastening one end of said outer casing to said rack casing;

(e) an inclined hole for slidably inserting said inner cable, extending from the top end of said projection to said groove; and

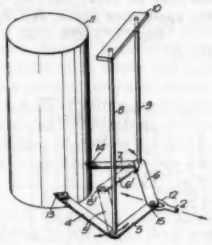
(f) a fitting member for fastening one end of said inner cable to said rack at one end of said groove; said rack casing being mounted to the boat at a prescribed rotational angle to a horizontal direction around the steering shaft.

4,495,882

HAWSER ATTACHMENT

Ivar Krogstad, Arendal, Norway, assignor to A/S Pusnes Marine and Offshore Services, Norway

Filed Apr. 20, 1983, Ser. No. 486,818
Claims priority, application Norway, Apr. 27, 1982, 821389
Int. Cl.³ B63B *21/20*
U.S. Cl. 114—230 **2 Claims**



1. A device for reducing tensile forces in a mooring hawser (2) occurring when a ship such as a tanker is moored to a loading buoy or a fixed or jointed (16) tower (17) having a rotatable top (11), comprising, in combination:

(a) a symmetrical linkage (4–7) comprising four links (4, 5, 6, 7) and to which the said hawser (2) is attached (15) on the axis of symmetry thereof,

(b) means (13, 14) pivotally connecting said linkage (4–7) to the said rotatable top (11),

(c) a pair of torsion bar means (8, 9) with one end of said pair being non-rotatably attached to one or more of the links (4, 5, 6, 7) in said linkage (4–7) and the other end of said pair being secured against rotation in a common yoke (10) so that torsion moments are entirely absorbed as internal forces in said yoke (10),

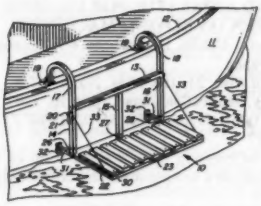
(d) each of said pair of torsion bar means (8, 9) comprising several torsion bars (22) which are non-rotatably attached at each end to a plate (20, 20') having an axis (21), so that when one of said plates (20) is rotated about said axis (21), the rotation angle for each torsion bar (22) is the same as for said one of said plates (20).

4,495,883

ADJUSTABLE DIVING PLATFORM

Paul E. Hoy, 4808 Escobar Ave., Naples, Fla. 33940

Filed Jul. 18, 1983, Ser. No. 514,571
Int. Cl.³ B63B *17/00*
U.S. Cl. 114—343 **4 Claims**



1. An adjustable diving platform for mounting on a boat to provide a horizontal diving platform at the boat's waterline comprising

a platform consisting of a series of slats mounted on a rectangular frame,

a vertical frame consisting of a horizontal bar and a plurality of vertical bars depending from said horizontal bar,

means including a plurality of pins for hingedly connecting the rear of the rectangular frame of the platform to the lower ends of the vertical bars of the vertical frame,

a pair of hangers for suspending the diving platform from the boat, each of said hangers being in telescoping adjustment within one of the vertical bars of the vertical frame so as to position the platform along the side of the boat and adjacent the waterline,

a pair of flexible wires connected between the upper end of the vertical frame and the front portion of platform's rectangular frame for supporting the platform in a horizontal plane adjacent the waterline, and

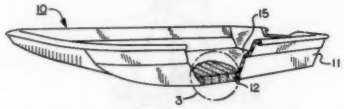
a pair of rods having ends of resilient material for resting against the side of the boat, each of said rods being in telescoping adjustment within one of the two side members of the platform's rectangular frame.

4,495,884

BOAT CONSTRUCTION AND METHOD

Terry R. Stark, Newport, N.C., assignor to Williams Lumber Yard, Beaufort, N.C.

Filed May 6, 1983, Ser. No. 492,491
Int. Cl.³ B63B *5/24*
U.S. Cl. 114—357 **9 Claims**



1. A method of forming a high strength-to-weight ratio boat hull which is stackable so the inner deck of the lower hull can contact the bottom of the upper hull comprising: preforming a polymeric outer shell with outwardly extending relatively thin sides and a laterally flat, relatively thick bottom with respect to said sides, placing a first mat saturated with a hardenable resin on the bottom inside the outer shell, positioning a first flotation log member longitudinally athwartwise from side to side on the first mat, extending said first mat alongside said first log member, abutting said first mat with a second mat placed on the bottom of said shell, placing a second log member beside said first log member athwartwise on said second mat along the bottom of the shell to allow said first log and said second log members to be separated by said first mat, and applying a gel coat over said first log member whereby said log members are totally encapsulated.

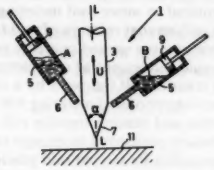
4,495,885

APPARATUS FOR TRANSPORTING AND DEPOSITING VISCOUS MATERIALS

Pierre L. L. M. Derks, and Gerardus Van Herwijnen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 497,465, May 23, 1983, Pat. No. 4,460,619. This application Jan. 27, 1984, Ser. No. 574,330
Claims priority, application Netherlands, May 27, 1982, 8202164
Int. Cl.³ B05C *1/00*
U.S. Cl. 118—241 **8 Claims**

1. An apparatus for transporting and depositing viscous materials, in which a quantity of a viscous material to be transported and deposited is supplied by means of a vibrating tool to a substrate and is deposited on the substrate, having at least one vibratory tool serving as a transport member, characterized in that the vibratory tool comprises a sonotrode which forms part of an ultrasonic vibration device and which has at least one transport pin having a cross-section which decreases gradually towards the free end of the pin, said transport pin having an apical angle, and having at least one transport surface which is inclined relative to the direction of vibration of the sonotrode, said sonotrode vibrating in a direction parallel to its longitudinal axis, the apparatus being further characterized in that it has



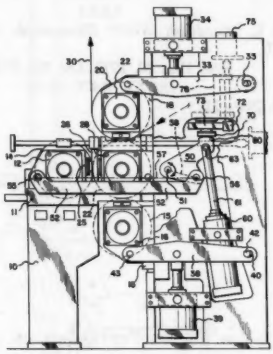
at least one metering device dispensing a quantity of viscous material on said sonotrode.

4,495,886

PRECISION ROLL COATER

Richard W. Phelps, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Sep. 26, 1983, Ser. No. 536,021
Int. Cl.³ B05C *1/08*
U.S. Cl. 118—249 **8 Claims**



1. In a precision roll type coater in which a coating transfer roll applies a metered quantity of coating material to a moving web of paper or the like supported on a back-up roll, which quantity of coating material is controlled by a metering roll running in close relation to a coating transfer roll, the improvement comprising:

a frame,

bearing block means mounting said coating transfer roll on said frame,

means for applying an excess of coating material to the coating transfer roll for metering by said metering roll,

guideways on said frame for mounting said metering roll providing for translatory movement of said metering roll toward and away from said coating transfer roll,

bearing blocks mounting said metering roll in said guideways for such translatory movement,

links having one end pivotally connected to said metering roll bearing blocks,

a bellcrank for each of said links, each said bellcrank having a pivotal connection to said frame and further having a pivotal connection to one of said links so that rotational movement of said bellcranks is accompanied by translatory movement of said metering roll along the path of said guideways,

the pivotal connection of each of said links on the respective said bellcranks being positioned such that an imaginary line through the pivotal connections of said links with said blocks and said bellcranks approaches parallelism with a

radius from the bellcrank pivot axis to the link pivot connection, as said metering roll approaches said coating transfer roll, and said imaginary line approaches a generally right-angle relationship to said radius when said bellcranks are rotated to move said metering roll away from said transfer roll, so that rotation of said bellcranks from a first open position to a second operable position results in an initially rapid movement of said metering roll toward said coating transfer roll followed by a slowing down of the rate of movement of said metering roll as said metering roll approaches said coating transfer roll,

movable stop means positioned to engage said bellcranks as said link approaches its second said position,

fixed stop means between the bearing block means of said coating transfer roll and said metering roll bearing block defining the metering position of said metering roll with respect to said transfer roll,

said movable stop means being operable to retreat from engagement with said bellcranks following contact of said bearing blocks with said fixed stop means, to provide for the biasing of said bearing blocks against said fixed stop means by said bell crank, and

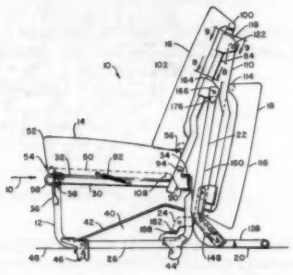
actuator means connected to rotate said bellcranks.

4,495,887

SEAT

Ronald L. Mondrush, 37819 Rhonswood, Northville, Mich. 48167

Filed Dec. 20, 1978, Ser. No. 971,357
Int. Cl.³ A47C *13/00*
U.S. Cl. 297—118 **11 Claims**



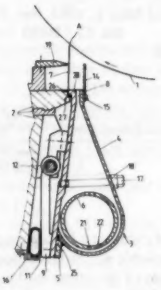
1. A seat comprising a seat base including U-shaped members at each side thereof, a rectangular frame secured to the free ends of the U-shaped members and means for securing the U-shaped members at the connecting portions thereof to the floor of a van or the like, seat bottom structure including a generally rectangular frame, a seat cushion constructed on the seat bottom structure frame, a clip secured to the rectangular frame of the seat base at the front thereof in a lost motion connection and in engagement with the seat bottom structure frame at the front thereof permitting limited relative horizontal movement between the seat base and seat bottom structure and pivotal movement of the seat bottom structure about the front lower edge thereof, resilient means operable between the seat base and seat bottom structure for urging the seat bottom structure backward on the seat base, seat back structure including seat back supporting members pivotally mounted on the seat base having portions extending above the seat bottom structure for supporting a seat back cushion and portions extending below the seat bottom structure for engaging the seat bottom structure to pivot the back of the seat bottom structure up and allowing it to move backward on pivoting of the seat back structure into a horizontal position, a seat back structure rectangular frame secured to the seat back structure supporting members and a seat back cushion constructed on the seat back structure frame, auxiliary seat structure including auxiliary seat structure supporting a rectangular frame secured to the auxiliary seat structure supporting members and an auxiliary seat structure cushion constructed on the auxiliary seat structure frame, and releasable locking means secured to the seat base and auxiliary seat structure and automatically, releasably engageable on movement of the seat back structure and auxiliary seat structure into the substantially vertical positions thereof.

4,495,888

COATING MECHANISM

Albert Wöhrle, Heidenheim, and Franz Krautzberger, Heidenheim-Grosskuchen, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed May 17, 1983, Ser. No. 495,249
Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220075
Int. Cl.³ B05C *5/02*
U.S. Cl. 118—410 **7 Claims**



1. Coating mechanism for coating continuous webs of product, especially paper, including a horizontal supporting member having a coating blade held thereon by clamping means and having a coating surface and a coating edge, said clamping means having at least one deformable pressure member spaced apart from said coating blade, said pressure member adapted to be connected to a source of pressure medium, said coating surface of said coating blade and the web of product forming therebetween an application slot, and a rigid pressure chamber having an opening therein and adapted for supplying a coating composition through said opening to said application slot for application of the composition to the web, characterized in that said pressure chamber is pivotally connected to said supporting member and pivotable about a pivot axis disposed intermediate the ends of said pressure chamber said axis further being between said coating edge of said coating blade and said pressure member, and said clamping means including said coating blade being securely pressed between said supporting member and said pressure chamber acting as a transfer medium for the expansion force of said pressure member.

4,495,889

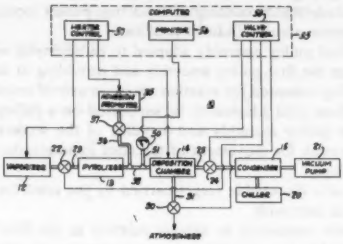
POLYMERIC FILM COATING APPARATUS

Thomas J. Riley, 905 Richmar Dr., Westlake, Ohio 44145

Filed Nov. 24, 1982, Ser. No. 444,486
Int. Cl.³ B05C *15/00*
U.S. Cl. 118—666 **4 Claims**

2. In an apparatus for coating workpieces with polymer film based on p-xylylene by vapor-phase polymerization including a vaporizer, a pyrolizer and a deposition chamber connected in series, the improvement comprising means for sensing pressure of monomer vapor downstream from the pyrolizer, means for continuously comparing the monomer pressure to a predetermined pressure needed to minimize the time to effect a com-

pleted polymeric reaction in the deposition chamber, and means for continuously controlling the temperature of vapori-



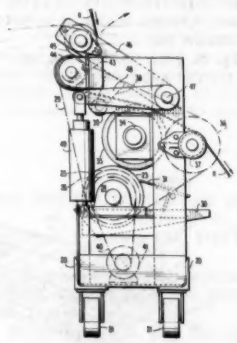
zation in response to differences between the actual pressure and the predetermined pressure.

4,495,890

MOBILE COATER

Willem A. Nikkel, Covington, and John B. Young, Richmond, both of Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Jul. 13, 1983, Ser. No. 513,361
Int. Cl.³ B05C *1/08, 11/02*
U.S. Cl. 118—674 **6 Claims**



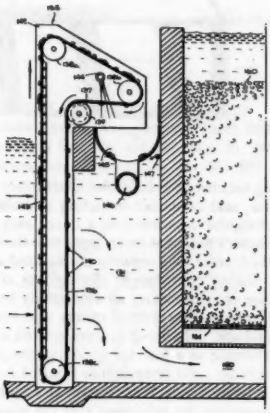
1. A web coating apparatus comprising manually mobile frame means for supporting a rotatively driven gravure roll in surface drive nip contact with a resiliently covered transfer roll for transfer of a doctored film thickness of liquid coating material to one side of a traveling web, a counter-rotatively driven smoothing roll in surface contact with the coated side of said traveling web, a pair of drive rolls pressed into mutual, rolling nip contact for receiving said web therebetween for rotationally powering said drive rolls prior to receipt of said coating material, rotary drive elements secured to one of said drive rolls and to said gravure and smoothing rolls, respectively, and, rotational drive linkage means connecting said drive elements for driving said gravure and smoothing rolls with the rotational power delivered by said traveling web to said one drive roll.

4,495,891

METHOD AND APPARATUS FOR REARING AQUATIC ANIMALS

Charles Dugan, Goulds, and Timothy Dugan, Homestead, both of Fla., assignors to Farm Fresh Shrimp Corporation, Fort Lauderdale, Fla.

Division of Ser. No. 57,322, Jul. 13, 1979, Pat. No. 4,382,423, which is a continuation-in-part of Ser. No. 952,664, Oct. 19, 1978, Pat. No. 4,285,298. This application Feb. 11, 1983, Ser. No. 465,764
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **8 Claims**



1. A particulate filter for use in a system for rearing aquatic animals having at least one rearing means including a tank containing a medium, and a filtration system, said tank and said filtration system having a common wall, said particulate filter comprising:

an endless belt formed of material which is substantially permeable to said medium and substantially impermeable to particulate matter, whereby particulate matter is collecting on the surface of said belt immediately contacting said medium when said medium passes through said belt, said belt having a first surface with evenly spaced elongated teeth secured thereto and a substantially smooth second surface opposite said first surface;

means for positioning and transporting said belt comprising a drive roller having a plurality of lengthwise slots for engaging said elongated teeth, and at least one driven roller disposed to contact said second surface;

means for driving said positioning and transporting means;

means for dislodging from the surface of said belt the particulate matter collected thereon;

means for housing said positioning and transporting means, said driving means and said dislodging means, said housing means being slidably and removably mounted in said common wall between said tank and said filtration system;

means for receiving particulate matter dislodged from said belt; and

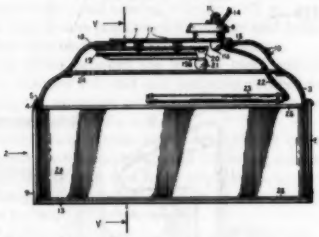
means responsive to the medium level immediately downstream of the particulate filter for actuating said driving means and said dislodging means.

4,495,892

INCUBATOR FOR PIGLETS

Francisco Y. Jodar, and Agustin A. Arcas, both of Lorca, Spain, assignors to D. Agustin Amador Arcas Y Nipor S.A., Lorca, Spain

Filed Jan. 10, 1983, Ser. No. 456,755
Claims priority, application Spain, Oct. 29, 1981, 261.111
Int. Cl.³ A01K *1/00, 1/02*
U.S. Cl. 119—16 **14 Claims**



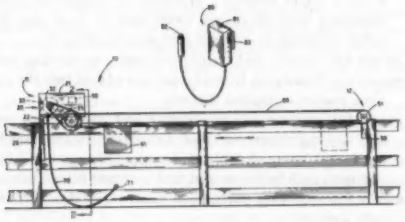
1. A pig incubator, comprising a container for holding piglets therein, said container including a housing of a substantially rectangular cross-section, a cover carrying at least one heating element mounted on an inner side thereof such that the piglets which enter the container are situated under the heating element, and a floor plate at the bottom of said housing; a temperature control means; an emergency heating element; a light, said temperature control means, said emergency heating element and said light being accommodated in said cover, said light functioning as a lure for grouping the piglets under the heating element, said temperature control means including a thermostat located outside said cover and a pilot light mounted on said thermostat for indicating that the heating element is in operation, said cover having a base of a rectangular cross-section and a peripheral surface having a front side and a back side, said base being connected to said housing, said front side and back side being symmetrically curved, said cover having a top provided with a central slit-like opening; and an insert mounted in said slit-like opening, said insert including two superimposed metal plates vertically spaced from each other, a lower one of said plates being a reflecting plate, said thermostat being mounted on an upper one of said plates, said heating element being mounted on said reflecting plate.

4,495,893

METHOD FOR ELICITING RESPONSES BY ANIMALS TO MOVING, VISUALLY DISCERNIBLE STIMULI, AND APPARATUS FOR PROVIDING A MOVING VISUALLY DISCERNIBLE STIMULUS

Gregory U. Genelin, 14788 Sky View Rd., Madera, Calif. 93638

Filed Nov. 4, 1983, Ser. No. 548,621
Int. Cl.³ A01K *15/02*
U.S. Cl. 119—29 **2 Claims**



1. An apparatus for providing a stimulus visually discernible by a horse surmounted by a rider, the movement and cessation of movement of the stimulus being adapted to elicit responses from a horse, the apparatus comprising:

a first pulley assembly adapted to be deployed in an elevated attitude and providing at least one pulley mounted for rotation about an axis of rotation;

a second pulley assembly adapted to be deployed remotely from the first pulley assembly and providing at least one pulley mounted for rotation about an axis of rotation;

a endless cord adapted to be supported on a pulley of the first pulley assembly and a pulley of the second pulley assembly for movement of the cord upon rotation of the pulleys;

a visually discernible target carried by the cord for movement therewith;

a motor connected in driving relation to the first pulley assembly and operable to impart rotation to the pulley thereof on which the cord is supported, the motor being selectively operable to cause the cord to move the target in a predetermined first direction and to cease such movement after the target has been moved a selected distance, and subsequently to cause the cord to move the target in a second, opposite direction, the motor further being selectively operable to cause the cord to resume moving in the first direction after such cessation of movent without movement in the second direction;

signal means operable by the rider of the horse for causing the motor to drive the pulley assembly to move the target in a selected direction; and

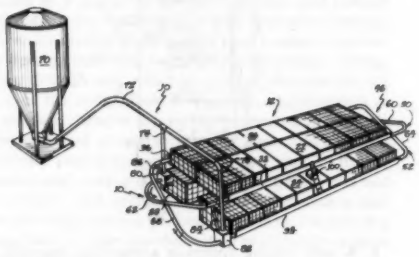
a housing bearing the motor and first pulley assembly and adapted to be mounted on an upright support for pivotal movement about a substantially vertical axis between a first position wherein the motor is deployed in an operative attitude and a second, stored position when the apparatus is not in use.

4,495,894

FEED DISTRIBUTION APPARATUS

Ray E. Swartzendruber, Syracuse, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Sep. 28, 1983, Ser. No. 536,768
Int. Cl.³ A01K *39/012*
U.S. Cl. 119—51 R **20 Claims**



20. A method of delivering feed to a plurality of poultry cages which are organized in an oppositely facing, multi-level array, the method comprising the steps of endlessly urging a first mass of feed particles along a first path past an upper level of cages facing in a first direction and past a lower level of cages facing in an opposite direction for presenting the feed particles to birds in said cages, endlessly urging a second mass of feed particles along a second path past an upper level of cages facing in that second or opposite direction, and past a lower level of cages facing in the first direction for presenting the feed particles to birds in said cages, and transferring said feed paticles between said first and said second endless paths to adjust the level of feed in the paths.

4,495,895

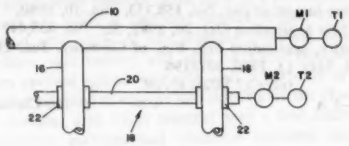
LIVESTOCK FEEDER

Donald G. Reeder, R.R. #6, Box 120, Galesburg, Ill. 61401

Filed Sep. 19, 1983, Ser. No. 533,290

Int. Cl.³ A01K *5/02*

U.S. Cl. 119—52 AF **3 Claims**



1. A livestock feeder having an elongated horizontal housing including means for moving feed material lengthwise thereof, said housing having a bottom provided with a plurality of feed openings spaced apart lengthwise the bottom and through which feed material is dropped, a plurality of similar, cylindrical, vertical drop tubes equal in number to the openings and arranged to receive material gravitationally respectively from the openings, and metering means for intercepting and then gravitationally dispensing predetermined amounts of material through the drop tubes, characterized in that the metering means comprises a plurality of elements, one for each drop tube, said elements being disposed below the housing and journaled respectively in the drop tubes on a common horizontal axis intersecting the drop tubes, each element being basically cylindrical about the horizontal axis and of a diameter equal to the inside diameter of a drop tube, the cylindrical nature of each element being interrupted to provide a pocket initially facing upward to receive material from above, each element being invertible about said horizontal axis to dump received material downwardly into its drop tube while presenting an uninterrupted portion of its surface upwardly to temporarily prevent further receipt of material by the element until the element is re-inverted, said elements being separate from each other and arranged initially with all pockets facing upwardly, and shaft means coaxially interconnecting the elements, each element further comprising a pair of complementary cylindrical members coaxially disposed and fixed to the shaft in abutting end-to-end relationship to each other, each member having a recess therein at its end abutting the other member, the recesses being alined to combine to provide the pockets.

4,495,896

DISC FOR THE PROTECTION OF THE UDDER OF A COW

Gerardus C. Baas, Meentweg 87A, 3755 PB Eemnes, Netherlands

PCT No. PCT/EP82/00078, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/03312, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 2, 1982, Ser. No. 433,202

Claims priority, application Netherlands, Apr. 7, 1981, 8101698

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—146 **4 Claims**

1. A disc protecting the udder and the nipples of a cow against injuries inflicted by her hind legs and hooves, said disc comprising:

a flexible material in a wedge-like, circular configuration decreasing in thickness from a central region towards a soft outer rim with smooth upper and lower surfaces, said material being of wedge-like configuration to slide under the udder of the cow upon contact with the udder, said material being of sufficient thickness to bend upon contact with the udder; and

said flexible material defining a hole at its center to surround the hind leg of the cow and to be attached to the cow near a hoof of the hind leg of the cow, said surface of said material is uninterrupted except for at least one incision running from said center hole towards said outer rim and

terminating before said outer rim to position the disc on the hind leg of the cow.

4,495,897

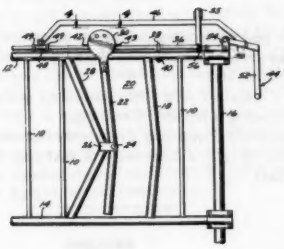
CATTLE STANCHION APPARATUS

Teo Albers, Sr., 18007 Arline Ave., Artesia, Calif. 90701

Continuation-in-part of Ser. No. 431,264, Sep. 30, 1982,. This application Jul. 22, 1983, Ser. No. 516,384

Int. Cl.³ A01K *1/06*

U.S. Cl. 119—148 **16 Claims**



10. In cattle stanchion apparatus including fixed and release stanchions laterally spaced apart to define a head opening for an animal; a horizontally extending top rail above said release stanchion; mounting means mounting said release stanchion for pivotal movement between an open position in which the upper part of said head opening is enlarged to enable an animal to place its head through said opening, and a closed position in which said upper part of said head opening is narrowed to hold the animal's head in said opening; a generally horizontally extending positioner adjacent and parallel to said top rail, longitudinally movable between extended and retracted positions, and pivotable about a longitudinal axis; rotating means operative to rotate said positioner about said longitudinal axis between a first position and a second position; and operator means operative to move said positioner between said extended and retracted positions, the improvement comprising:

a first coupler carried by said positioner and projecting outwardly thereof;

an elongated latch having an inner extremity pivotally mounted to the upper extremity of said release stanchion, the outer extremity of said latch being slidable along said positioner in one direction to enable movement of said release stanchion from said closed position to said open position, said outer extremity of said latch being slidable along said positioner in the opposite direction for engagement with said first coupler in said first position to stop movement of said release stanchion in a direction away from said open position and past said closed position to a downed cattle release position wherein the lower extremity of said release stanchion is spaced farther from said fixed stanchion to define a wider space at the bottom of

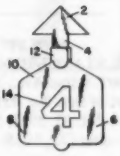
said head opening, said latch being manually actuable to disengage said first coupler.

4,495,898

PEST CONTROLLING ANIMAL TAG

Ali A. Akhavein, Goldsboro, and Gavin B. Braithwaite, Fremont, both of N.C., assignors to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 267,631, May 27, 1981, Pat. No. 4,366,777. This application Sep. 22, 1982, Ser. No. 421,139
The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.
Int. Cl.³ A01K *13/00*
U.S. Cl. 119—156 **13 Claims**



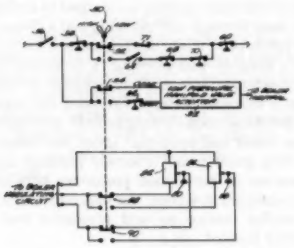
1. A pest controlling device for animals comprising:
(i) an animal identification tag adapted to be attached to an animal; and
(ii) a reservoir of a pest controlling active ingredient surrounding a portion of said tag,
said reservoir comprising a relatively flexible tape portion and attached thereto, a depository of said pest controlling active ingredient.

4,495,899

LOW PRESSURE RELIEF VALVE ASSEMBLY FOR HIGH PRESSURE BOILER

Victor V. Carberry, X N55 W21404 Logan Dr., Menomonee Falls, Wis. 53051

Filed Apr. 11, 1984, Ser. No. 599,016
Int. Cl.³ F22B *37/42*
U.S. Cl. 122—504 **11 Claims**



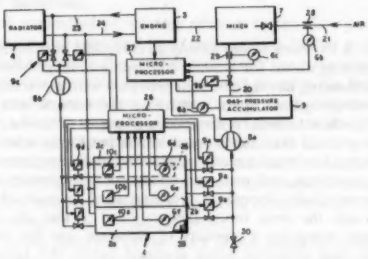
1. Apparatus for providing for low pressure operation of a high pressure boiler, the high pressure boiler including a high pressure relief valve, a boiler burner, and means for controlling operation of the boiler burner to provide for high pressure operation of the boiler, the apparatus comprising:
a low pressure relief valve mounted on the boiler and adapted to release steam from the boiler at a steam pressure lower than the pressure developed during high pressure operation of the boiler,
means for selectively connecting said low pressure relief valve to the boiler.

4,495,900

METHANE STORAGE FOR METHANE-POWERED VEHICLES

Rolf Stockmeyer, Linnich-Tetz, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 158,113, Jun. 10, 1980, abandoned. This application Oct. 20, 1982, Ser. No. 435,492
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1979, 2923561; May 13, 1980, 3018196
Int. Cl.³ F02B *43/04*
U.S. Cl. 123—1 A **10 Claims**



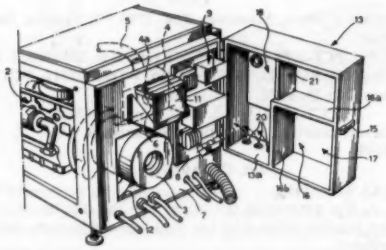
1. A methane-storage system for a methane-powered vehicle, comprising:
a pressure-retentive tank adapted to contain a pressure of up to about 15 bar; and
a methane-storage filler in said tank consisting of a mass of binder-free compacts of zeolite having a density of at least 0.7 g/cm³ and forming a solid adapted to hold methane with a minimum packing density of about 10, with respect to the empty tank, at room temperature and at a pressure of 10 bar.

4,495,901

GENERATOR APPARATUS FOR THE COMBINED PRODUCTION OF ELECTRICAL ENERGY AND HEAT

Alessandro Nannini, Bruino, and Roberto Pagano, Turin, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Mar. 28, 1983, Ser. No. 479,546
Claims priority, application Italy, Mar. 31, 1982, 53142/82[U]
Int. Cl.³ F02B *63/04*
U.S. Cl. 123—2 **1 Claim**



1. A generator apparatus for the combined production of electrical energy and heat comprising a parallelepiped-shaped housing, a combination internal combustion engine and electrical machine mounted in said housing, said housing having a side wall provided with first and second apertures adjacent one vertical edge thereof with said first aperture located above said second aperture, duct means in said housing communicating said first aperture with said internal combustion engine for

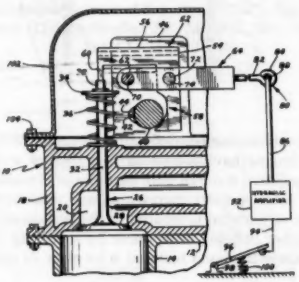
supplying air thereto with said electrical machine extending outwardly of said housing through said second aperture, a battery mounted on said side wall outside of said housing in spaced relation to said aperture, electrical equipment means mounted on said side wall adjacent the opposite vertical edge thereof, a cover member in the form of a substantially parallelepiped box open at one side thereof hinged to one of said vertical side edges of said housing covering said electrical machine, said battery and said electrical equipment means when pivoted against said side wall, a partition in said cover member adapted to engage said side wall in the closed position for dividing said cover member into a first chamber which completely encloses said electrical machine and a second chamber which completely encloses said electrical equipment means and said battery with said first and second chambers being isolated from each other, and opening means in said cover member adjacent the bottom thereof whereby upon operation of said internal combustion engine, air will be drawn into said cover member through said opening means and pass over said electrical equipment means and said battery before being drawn into said internal combustion engine through said first aperture and duct means as preheated air.

4,495,902

MECHANISM FOR VARIABLY CONTROLLING AN INTERNAL COMBUSTION ENGINE VALVE

Corliss O. Burandt, Plymouth, Minn., assignor to Investment Rarities, Incorporated, Minneapolis, Minn.

Filed May 5, 1983, Ser. No. 491,819
Int. Cl.³ F01L *1/34*
U.S. Cl. 123—90.16 **25 Claims**



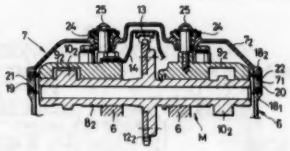
9. A mechanism for operating a valve of an internal combustion engine having a rotatable camshaft, a cam on said camshaft, a combustion chamber and a reciprocable valve member for opening and closing a valve port in communication with the combustion chamber, the mechanism comprising a rocker arm having first and second angularly disposed and integrally connected legs, said first leg having a cam follower surface thereon including a first linear section and a second nonlinear section, means mounting said rocker arm for rocking movement about a first axis, and means for shifting said first axis relative to said camshaft so that various portions of the cam follower surface on said first leg are relatively engageable with said cam, said linear and nonlinear sections providing said various portions, said second leg including a single portion thereof engaging said valve member so that only said single portion acts on said valve member, and an eccentric ramp portion on said camshaft adjacent one side of said cam, said first leg having a nonlinear edge adjacent one side of said linear section, said nonlinear edge being engageable with said eccentric ramp portion.

4,495,903

INTERNAL COMBUSTION ENGINE

Akira Asano, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,957
Claims priority, application Japan, Sep. 19, 1981, 56-148184
Int. Cl.³ F01L *1/46*
U.S. Cl. 123—90.38 **8 Claims**



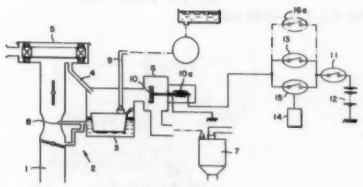
1. An over head cam internal combustion engine for mounting adjacent a frame member, comprising a valve actuating mechanism having a camshaft accommodated in a space defined by both a cylinder head and a head cover joined to the upper face of said cylinder head, said head cover including an annular member removably overlaid on the upper face of said cylinder head, and a dish-shaped member removably overlaid on said upper face of said annular member, wherein the distance to said cylinder head from the boundary surface between said dish-shaped member and said annular member is greater than the distance to said cylinder head from said camshaft and wherein the boundary surface between said annular member and said cylinder head is located substantially level with the longitudinal axis of said camshaft wherein said distances are such that said head cover can be removed through a clearance between said valve mechanism and said frame which is smaller than the collective height of said head cover.

4,495,904

APPARATUS FOR FACILITATING ENGINE STARTING

Michio Sakaino, Saitama; Hisashi Igarashi, Tokyo, and Yutaka Taniguchi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 429,623
Claims priority, application Japan, Jan. 14, 1982, 57-3333
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—179 G **7 Claims**



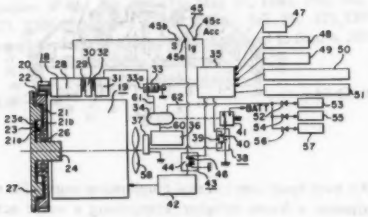
1. Apparatus for facilitating the starting of an internal combustion engine, the engine having an air intake passage and a carburetor interposed in said passage, the carburetor including a float chamber having a fuel inlet, and a fuel nozzle communicating with the float chamber and the intake passage, the improvement comprising, in combination: a vent passage leading from said chamber, a cut valve operable to close said vent passage, means for opening said cut valve and maintaining it open during restarting in response to high engine temperature and at least one other engine starting condition to prevent an increase in pressure within the float chamber from delivering an excessive amount of fuel through said fuel nozzle.

4,495,905

STARTING DEVICE

Akira Morishita; Toshinori Tanaka, both of Himeji; Kouichi Matsumoto, Tatsuno, and Takeo Gotou, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,880
Claims priority, application Japan, Jan. 8, 1983, 58-2075
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—179 F 10 Claims



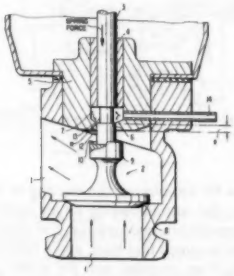
1. A starting device which comprises a first power transmitting device connected to a crank shaft of the engine of a car, a compressor driven by a power output from said first power transmitting device, an air motor whose rotary shaft is driven by feeding compressed air of said compressor through an air reservoir via an air feeding tube, a valve device placed in said air feeding tube, a second power transmitting device installed between said rotary shaft and said crank shaft, a stopping device for stopping said engine when a burden of said engine disappears during car driving, and a controlling device which causes said air motor to actuate by opening said valve device at the time of restarting said engine to control starting of said crank shaft through said second power transmitting device.

4,495,906

VALVE GUIDE ARRANGEMENT FOR THE VALVE STEM OF A VALVE IN AN INTERNAL COMBUSTION ENGINE

Franz Bender, Wendlingen; Gernot Hertweck, Fellbach; Michael Grohn, Esslingen, and Peter Moser, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Dec. 7, 1982, Ser. No. 447,665
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149776
Int. Cl.³ F01L *3/08*
U.S. Cl. 123—188 GC 3 Claims



1. A valve guide arrangement for a valve controlling the exhuast gas flow of an internal combustion engine, comprising a bush fixed rigidly in a housing part as a valve guide, an annular settling space between the valve guide and a valve head, the annular settling space disposed in a housing part and surrounding a valve stem of the valve, the annular settling space being connected with the exhaust gas flow by means of an annular throttling gap formed by the housing part and the valve stem, wherein the valve comprises

a blow down valve means opening automatically in the flow direction against a spring force and towards the valve guide and leads the exhaust gas flow to a bypass duct,

the annular throttling gap formed by the housing part and the valve stem has a length corresponding to approximately half the diameter of the valve stem, and

the valve stem comprises a part which is reduced relative to the normal diameter of the stem, this part lying in the region of the annular settling space when the valve is closed,

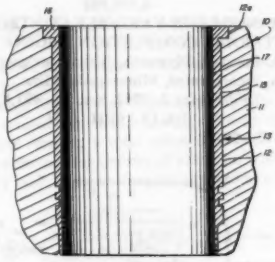
the length of the reduced part is such that it is not immersed completely into the valve guide when the valve is fully opened.

4,495,907

COMBUSTION CHAMBER COMPONENTS FOR INTERNAL COMBUSTION ENGINES

Roy Kamo, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 18, 1983, Ser. No. 458,804
Int. Cl.³ B32B *15/04*
U.S. Cl. 123—193 C 7 Claims



1. A combustion chamber defining component of an internal combustion engine having on a surface thereof a layer of a thermally insulative material with particles of chromium oxide dispersed at least partially therewithin and wherein the thermally insulative material is secured to the surface of the combustion chamber defining component by a coating of a bond material wherein the bond material is an alloy of nickel, iron and chrome.

4,495,908

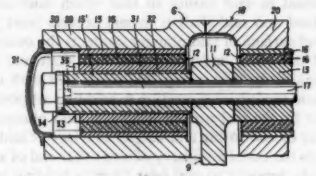
INTERNAL COMBUSTION ENGINE WITH IMPROVED SOUND-INSULATION

Thomas Eidenböck, Graz, Austria, assignor to Avl Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H., Graz, Austria

Filed Sep. 30, 1983, Ser. No. 537,519
Claims priority, application Austria, Dec. 3, 1982, 4418/82
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—195 C 5 Claims

1. An internal combustion engine having an engine unit and an engine unit support, said engine unit comprising such sound-generating parts as cylinders, cylinder head, pistons, piston rods, crankshaft bearings and crankshaft, a crankcase, said support being attached to said crankcase by means of several sound-insulating and force-transmitting elements insulating said crankcase against structure-borne sound, said elements being of substantially hollow cylindrical shape and located outside of an oil-wetted area in said crankcase with their axes being parallel to the axis of said crankshaft, wherein a multi-

arm bracket is mounted at least at an output end of said engine unit support for reducing relative movements of said support to swinging movements around said crankshaft axis, said bracket being attached to seats of said crankshaft bearings and being provided with at least one of said sound-insulating elements at an end of each arm thereof, said bracket arms and said sound-insulating elements being positioned symmetrically to said crankshaft axis, and wherein at least some of said sound-insulating elements are provided with inner sleeves coaxially



contained within outer sleeves directly unattached thereto with flexible material therebetween, said inner sleeves comprising setting elements being axially adjustable to a position relative to said outer sleeves when said engine unit support has been mounted in said crankcase so that the position of said setting elements fastened to said bracket arms relative to said crankcase can be adjusted in such a way as to make pre-stressing of said sound-insulating elements completely independent of this position.

4,495,909

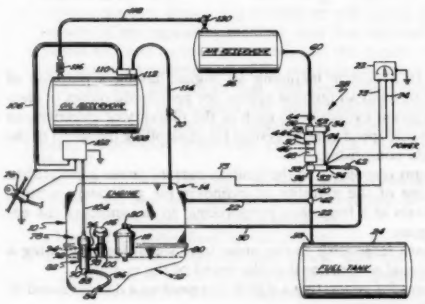
OIL CLEANING AND RECYCLING SYSTEM

Erwin E. Hurner, 2605 S. Rivershore Dr., Moorhead, Minn. 56560

Continuation-in-part of Ser. No. 218,918, Dec. 22, 1980, , which is a continuation-in-part of Ser. No. 192,077, Sep. 29, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 401,533

Int. Cl.³ F02B *13/00*

U.S. Cl. 123—196 R **8 Claims**



1. A process for maintaining a predetermined oil level within an oil pan of an internal combustion engine comprising the steps of:

sensing the amount of oil at a predetermined level;

signaling the sensing of an oil level below said predetermined level;

delaying response to said signaling for a first predetermined period of time after initiation of operation of said internal combustion engine;

delaying a transimission of said signaling until said sensing of an oil level below said predetermined level has perrsisted for a second predetermined period of time independent of said first predetermined period of time; and

after both first and second predetermined periods of time have elapsed adding oil to said oil pan so as to maintain said predetermined level.

4,495,910

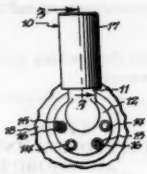
LOCKING VALVE CONSTRUCTION

John H. Taylor, Orchard Park, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Filed Apr. 21, 1982, Ser. No. 370,355

Int. Cl.³ F02B *77/00*

U.S. Cl. 123—198 B **9 Claims**



9. In a diesel engine having an engine block, a fuel pump mounted relative to said engine block, and a fuel inlet in said fuel pump: a fuel locking valve comprising a housing, a fuel locking valve inlet in said housing, a fuel locking valve outlet in said housing, mounting means mounting said housing on said fuel pump with said fuel locking valve outlet in communication with said fuel inlet of said fuel pump, a valve member in said housing, key means for moving said valve member between a first position for effecting communication between said fuel locking valve inlet and said fuel locking valve outlet for providing fuel to said fuel inlet of said fuel pump and a second position for preventing communication between said fuel locking valve inlet and said fuel locking valve outlet for preventing flow of fuel to said fuel inlet of said fuel pump, and locking means operatively associated with said mounting means for locking said fuel locking valve to said fuel pump for preventing unauthorized removal therefrom without destroying said fuel pump.

4,495,911

CHOKE DEVICE

Jan Y. N. Andreasson, Huskvarna, Sweden, assignor to EMAB Electrolux Motor Aktiebolag, Sweden

PCT No. PCT/SE81/00350, § 371 Date Jul. 16, 1982, § 102(e) Date Jul. 16, 1982, PCT Pub. No. WO82/01917, PCT Pub. Date Jun. 10, 1982

PCT Filed Dec. 1, 1981, Ser. No. 403,646

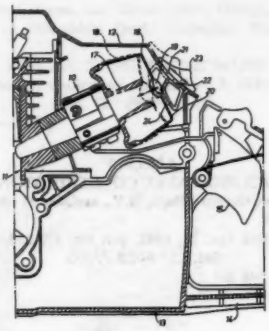
Claims priority, application Sweden, Dec. 2, 1980, 8008463

Int. Cl.³ F02B *77/00;* **F02M** *1/02*

U.S. Cl. 123—198 R **7 Claims**

1. In an internal combustion engine system having an air filter mounted on the intake opening of a carburetor; the improvement wherein the air filter comprises elastic frame means resiliently supporting a limiting wall means at a position spaced

from said intake opening, and further comprising manually operable means mounted to selectively engage said limiting



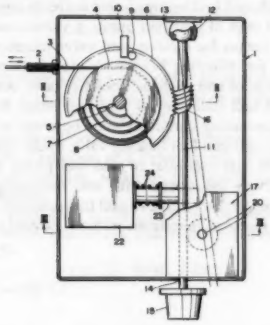
wall means to enable the blocking of said intake opening with said limiting wall means.

4,495,912

CONSTANT SPEED RUNNING DEVICE FOR AUTOMOBILE

Saburo Yanagisawa, No. 3-8-17, Tsukushino, Machida-shi, Tokyo, and Yoshinori Yonemori, No. 5-1-11, Higashigotandan, Shinogawa-ku, Tokyo, both of Japan

Filed Aug. 5, 1983, Ser. No. 520,570
Claims priority, application Japan, Aug. 5, 1982, 57-136788
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—350 **2 Claims**



1. A constant speed running device for an automobile which has an engine with a movable member which influences a fuel/air/mixture, and a wire attached to said member operating and adjusting said member by being pulled and relaxed, said device comprising:

a casing,

a drum rotatably mounted in said casing and having an axis, said wire being partially wound on said drum and extending out of said casing to said member,

a gear coaxially fixed to said drum,

a spring biasing said drum and said gear to rotate in a direction to wind said wire onto said drum when said wire is relaxed,

a shaft having opposite ends and axis, one of said ends of said shaft being mounted in said casing for rotational and pivotal movement, said axis of said shaft being perpendicular to said axis of said drum,

a worm gear on said shaft, said shaft being laterally pivotable to and from a first set position with said worm engaging said gear and a second reset position with said worm disengaged from said gear, and

means for alternatively holding said shaft in said first set position or in said reset second position,

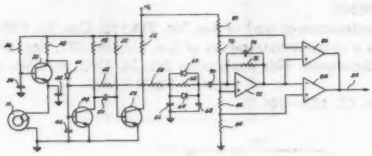
said set-reset holding means comprising a solenoid mounted in said casing, said solenoid including a coil, movable plunger mounted co-axially in said coil, and a spring urging said plunger in a direction opposite to the direction of urging by said coil when energized, said plunger having an end surface and a side surface; said solenoid being positioned in said casing so that when said coil is not energized and said shaft is in said second reset position, said end surface of said plunger contacts the outer periphery of the other end portion of said shaft and is urged thereagainst by said spring, and when said shaft is moved from said second reset position to said first set position, the contact by the end surface is broken, said plunger moves by force of said spring and said side surface of said plunger contacts the outer periphery of said other end of said shaft on a side opposite to said gear thereby holding said shaft in said first set position, the contact of the side surface and the outer periphery being broken when said coil is energized moving said plunger against the urging of the spring to release said shaft from said first set position.

4,495,913

IGNITION CURRENT SENSOR FOR AN ELECTRONIC SPEED CONTROL SYSTEM

Larry O. Gray, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 475,555, Mar. 15, 1983, abandoned. This application Oct. 18, 1983, Ser. No. 542,560
Int. Cl.³ F02D *11/10*
U.S. Cl. 123—352 **15 Claims**



1. In a vehicle including an engine having a plurality of cylinders and an ignition system for generating pulses of electric current cyclically to each of the plurality of cylinders, an electronic speed control system for controlling the speed of the vehicle comprising:

means responsive to the ignition current pulses generated to one of the plurality of cylinders for generating a pulse train at a frequency proportional to the speed of the engine;

means responsive to the pulse train signal for generating a signal proportional to the speed of the engine;

means for generating a signal representing a desired speed of the vehicle;

means operatively connected to the engine and responsive to the engine speed signal and the desired speed signal for controlling the speed of the vehicle in response thereto;

means for bypassing said engine speed signal generating means when the engine speed signal changes by more than a predetermined rate;

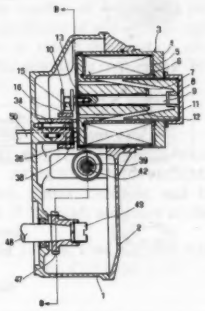
differentiator means responsive to said engine speed signal generating means and said bypassing means for generating a signal representing the rate of change of the speed of the engine; and

limit detector means responsive to the engine speed rate of change signal for generating a signal to disengage said means for controlling the speed of the vehicle when the engine speed rate of change signal changes beyond a predetermined range.

4,495,914
ELECTRIC GOVERNOR

Yoshiya Ishii, Toyota; Shuji Hachitani, Anjo, and Yasushi Tanaka, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 30, 1982, Ser. No. 373,782
Claims priority, application Japan, May 7, 1981, 56-68950
Int. Cl.[3] F02D *1/04, 1/06*
U.S. Cl. 123—357 1 Claim



1. An electric governor for attachment to a fuel injection pump for an internal combustion engine, the pump having an elongated movable fuel injection regulating member and a cam shaft, comprising:

a governor casing attachable to the fuel injection pump with the regulating member and the cam shaft projecting into said governor casing;

a solenoid type electromagnetic actuator fixed to said governor casing including a first coil, the axis of which is substantially parallel to the regulating member, and an output rod which is inserted into said coil to be substantially parallel to the regulating member, said output rod being movable axially in response to an electric signal to be applied to said coil;

a position detector detachably secured to said casing transversely of the regulating member, said first coil and said output rod, and including a second coil and a core which are positioned transversely of the regulating member, said first coil and said output rod, said core being movable reciprocally in said second coil and extending from said position detector into said casing, said position detector being removable from said casing from the exterior thereof,

a link mechanism positioned in said casing between said output rod and said core with the regulating member therebetween, said mechanism including:

a block detachably fixed to said casing;

a shaft extending through said block, said shaft being positioned at a side of said output rod opposite said position detector and at a side of the regulating member remote from said actuator;

a first lever connected between said output rod and said shaft to transmit reciprocal movements of said output rod to said shaft to oscillate the latter, said first lever being substantially in transverse relationship to said output rod;

a second lever positioned between said shaft and the regulating member to transmit oscillating movements of said shaft to the regulating member to reciprocate the latter, said second lever being substantially parallel to said first lever; and

a third lever positioned between said shaft and said core of said position detector to transmit oscillating movements of said shaft to said core to reciprocate the latter, said third lever being substantially normal to said first and second levers;

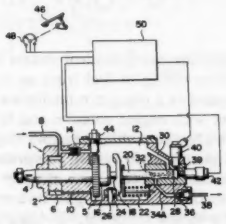
a spring supported by said position detector and said core in such a manner that said spring biases said third lever so as to balance with the electromagnetic force generated by said electromagnetic actuator; and

an electromagnetic pick-up fixed to said casing for detecting the rotational speed of the cam shaft, an electric signal from said pick-up being used to energize said first coil of said electromagnetic actuator.

4,495,915
FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINE

Kazuo Shinoda, and Nobuyuki Kobayashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 8, 1983, Ser. No. 483,276
Claims priority, application Japan, Apr. 19, 1982, 57-65078
Int. Cl.[3] F02D *31/00*
U.S. Cl. 123—357 16 Claims



1. A fuel injection device for an internal combustion engine, comprising:

a fuel injection pump including;

a high pressure chamber wherein fuel is applied with high pressure,

plunger means rotatably and slidably reciprocable in synchronism with rotation of the engine for introducing said fuel into said high pressure chamber, applying high pressure to said fuel in said high pressure chamber by slidable movement toward said high pressure chamber and feeding said fuel under high pressure to any one of cylinders in said engine, said slidable movement of said plunger beginning at a constant angular position of a crank shaft without regard to rotational speed of said engine,

a spill port formed in a wall defining said high pressure chamber for discharging said fuel in said high pressure chamber;

a solenoid valve for opening or closing said spill port;

a pressure sensor mounted facing said high pressure chamber for detecting pressure in said high pressure chamber; and

a control circuit for controlling said solenoid valve to close said spill port at a closing time to thereby inject fuel and open said port at a fuel injection ending time to stop fuel injection, said control circuit including;

first calculation means for calculating a fuel injection time period in accordance with operating conditions of the engine,

detection means for detecting a fuel injection starting time when pressure in said high pressure chamber as detected by said pressure sensor exceeds a predetermined pressure,

second calculation means for calculating said fuel injection ending time based on said fuel injection time period and said fuel injection starting time, and

third calculation means for calculating said closing time so that a next fuel injection takes place at said closing time if slidable movement of said plunger begins prior to said closing time.

4,495,916
FUEL INJECTION PUMP CONTROL SYSTEM IN DIESEL ENGINE

Kazuo Shinoda, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

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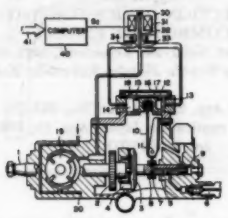
Claims priority, application Japan, Dec. 14, 1981, 56-201142
Int. Cl.³ F02D *1/06, 1/02*
U.S. Cl. 123—387 **11 Claims**



1. A fuel injection pump control system in a diesel engine wherein injection timing of fuel from an engine-driven feed pump is controlled by a plunger rotatably and axially movable in synchronism with engine rotation and fuel injection flow rate is controlled by the position of a spill ring movably associated with said plunger, said system comprising:

an electronic control section providing an output command signal in accordance with engine operating conditions;

control valve means selectively dividing a portion of fuel from said feed pump into two parts in response to a command signal; and

a spill ring adjusting means for positioning said spill ring independent of feed pump pressure including:

a cylinder,

a piston reciprocally received in said cylinder, respective ones of said two fuel parts being separately applied to said cylinder at opposite ends of said piston, said piston being linkingly connected to the spill ring, and

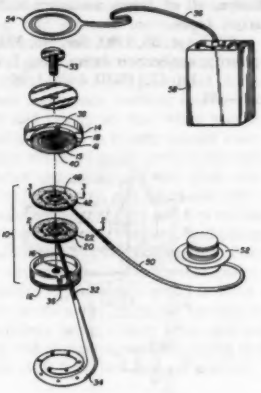
a pair of flow discharge means operatively connected to said cylinder for continually releasing said two fuel parts from said cylinder, the flow rate through each individual flow discharge means being determined by the position of said piston in said cylinder so that an increase in the flow rate of one of said two fuel parts provides an increase in the flow rate through a corresponding one of the flow discharge means and a decrease in the flow rate through the other flow discharge means.

4,495,917
SURGICALLY IMPLANTABLE DISCONNECT DEVICE

Charles L. Byers, Vacaville, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 26, 1982, Ser. No. 362,344
Int. Cl.³ A61N *1/04;* **A61F** *11/04*
U.S. Cl. 128—419 R **12 Claims**

1. A connector comprising a case, including a base member and a lid, the base member and lid being shaped to provide a cavity between them, a first contact pad of elastomeric material, a first set of electrical contacts embedded in the first contact pad, the contact pad being dimensioned to fit within the cavity, the contact pad being interposed between the lid and the base member, a second set of electrical contacts carried by the lid within the cavity, means for providing separate electrical connections through the case to the first and second sets of electrical contacts, and means for pressing the lid against the base member and the contact pad to exert a predetermined pressure on the pad, causing it to form a fluid tight seal around the first and second sets of electrical contacts,

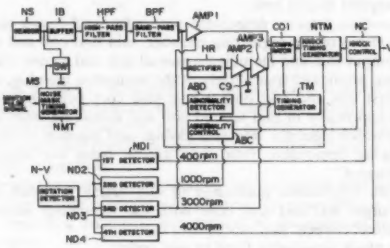


some of which are thereby placed in electrical contact with each other.

4,495,918
IGNITION TIMING RETARD ANGLE CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Noboru Sugiura, and Terumi Okado, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1980, Ser. No. 211,288
Claims priority, application Japan, Nov. 30, 1979, 54-154263; Nov. 30, 1979, 54-154264
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—425 **16 Claims**



1. An ignition retard angle control for use in an internal combustion engine, comprising:

first means for detecting vibrations of the engine to produce an output in the form of an electrical signal;

second means for discriminating part of the output signal of said first means in a characteristic frequency range in which a knock-induced vibration component appears remarkably when a knock is generated;

third means for amplifying an output signal of said second means at a first amplification degree;

fourth means for rectifying the output signal of said second means;

fifth means for averaging out an output signal of said fourth means;

sixth means for amplifying an output signal of said fifth means at a second amplification degree, said first and second amplification degrees being determined in such a manner that the peak of the instantaneous values of the

amplitude of the output signal of said third means exceeds the instantaneous value of the amplitude of the output signal of said sixth means only in the presence of a knock;

seventh means for comparing the output signals of said third and sixth means with each other to produce a knock signal showing the presence of a knock when the instantaneous value of the output signal of said third means exceeds that of the output signal of said sixth means; and

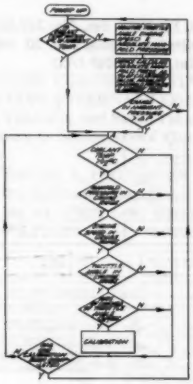
eighth means for generating a voltage signal having an amplitude corresponding to an ignition advance angle determined by the number of revolutions per unit time of the engine, the amplitude of said voltage signal being changed in a manner to retard the ignition advance angle by a predetermined amount in response to the generation of the knock signal.

4,495,919

CONTROL SYSTEM FOR AIR/FUEL RATIO ADJUSTMENT SYSTEM

Neville H. Daniel, Sutton Coldfield, and Hugh M. Duncan, Moseley, both of England, assignors to Austin Rover Group Limited, England

Filed Jul. 26, 1984, Ser. No. 634,585
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—440 **6 Claims**



1. A control system for an air/fuel ratio measurement and adjustment system for an internal combustion engine, the control system comprising: an ambient temperature sensor, an engine coolant temperature sensor and means for initiating measurement of the air/fuel ratio in response to the engine coolant temperature not exceeding ambient temperature by more than a predetermined amount.

4,495,920

ENGINE CONTROL SYSTEM AND METHOD FOR MINIMIZING CYLINDER-TO-CYLINDER SPEED VARIATIONS

Toshimi Matsumura, Aichi; Masahiko Miyaki; Hitoshi Tomishima, both of Oobu, and Akira Masuda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 7, 1983, Ser. No. 482,884
Claims priority, application Japan, Apr. 9, 1982, 57-60164; Jun. 7, 1982, 57-97286; Jun. 8, 1982, 57-98373
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—436 **8 Claims**

1. A method for injecting fuel in an internal combustion engine having a plurality of cylinders, comprising the steps of:

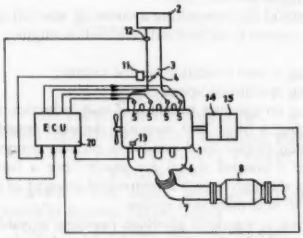
(a) successively detecting the speed of said engine at predetermined angular positions of an output shaft of said engine which correspond to said cylinders respectively and generating therefrom a series of first signals representing individual engine speed values of said cylinders;

(b) generating a basic injection control value representing the quantity of fuel to be injected in each of said cylinders as a function of said detected engine speed;

(c) sensing for each of said cylinders when the detected engine speed is steady;

(d) when said detected engine speed is steady, deriving a second signal representing an average value of said first signals during a predetermined period;

(e) successively detecting a deviation of each of said first signals from said second signal;



(f) generating a fuel injection trimming value for each of said cylinders in response to said deviation;

(g) detecting whether said trimming value is smaller or greater than a predetermined value;

(h) if said trimming value is smaller than said predetermined value, trimming said basic injection control value according to said trimming value;

(i) if said trimming value is greater than said predetermined value, resetting said trimming value to zero; and

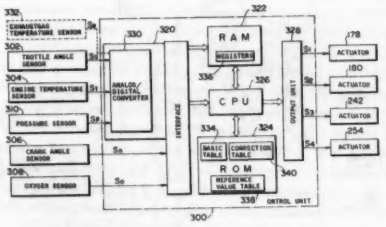
(j) operating each of said fuel injectors in response to said trimmed basic injection control value.

4,495,921

ELECTRONIC CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE CONTROLLING AIR/FUEL RATIO DEPENDING ON ATMOSPHERIC AIR PRESSURE

Kunifumi Sawamoto, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 24, 1982, Ser. No. 351,901
Claims priority, application Japan, Mar. 10, 1981, 56-33062
Int. Cl.³ F02M *7/00*
U.S. Cl. 123—438 **17 Claims**



1. An air/fuel ratio control system for an internal combustion engine for controlling the air/fuel ratio in response to engine operating conditions, and for correcting the air/fuel ratio depending on atmospheric air pressure, comprising:

first means for detecting at least one of said engine operating conditions and producing a first signal indicative of the detected engine operating condition;

second means for measuring an intake manifold absolute

pressure and producing a second signal representative of the measured intake manifold absolute pressure;

third means, responsive to said first signal, for determining a reference value signal to be compared with said second signal to obtain a difference value between the reference value signal and the second signal, said reference value signal having a value variable depending upon the value of said first signal and representative of an intake manifold absolute pressure;

fourth means, responsive to said difference value, for determining a correction value for said air/fuel ratio and producing a control signal having a value indicative of the corrected air/fuel ratio; and

fifth means, responsive to said control signal, for controlling the engine air/fuel ratio.

6. A method for controlling a metering amount of fuel to an induction system in an internal combustion engine, comprising steps of:

detecting a load condition on the engine;

detecting revolution speed of the engine;

detecting an absolute pressure of said induction system;

calculating a basic fuel metering amount based upon the detected engine load condition and the engine speed to derive a control signal for controlling a fuel metering means through which a controlled amount of fuel is supplied to said induction system;

calculating a standard absolute pressure in said induction system based on said engine load condition and said engine speed to derive a reference signal;

comparing said detected absolute pressure and said calculated standard absolute pressure to determine the difference therebetween;

deriving a correction value for said fuel metering amount based on the difference of detected absolute pressure and said calculated absolute pressure; and

modifying said control signal value by said correction value to derive a modified control signal to control said fuel metering means by said modified control signal.

4,495,922

AIR/FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

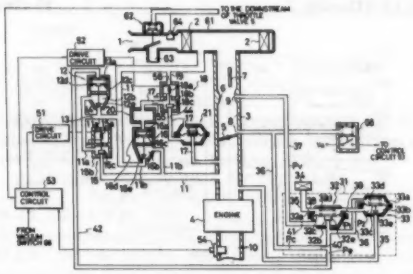
Akira Fujimura, Saitama, and Shunzaburo Ozaki, Sakado, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,833

Claims priority, application Japan, Feb. 10, 1983, 58-21145

Int. Cl.³ F02M *23/04*

U.S. Cl. 123—440 **2 Claims**



1. An air/fuel ratio control system for an internal combustion engine having an air induction system equipped with a choke valve, and an exhaust system, comprising:

a secondary air passage communicated with an intake air passage of said air induction system, downstream of a throttle valve disposed in said intake air passage;

a control vacuum generating means for generating a control vacuum by combining a vacuum around or downstream of said throttle valve with a vacuum of the inside of a venturi formed in said intake air passage;

an air control valve disposed in said secondary air passage for varying a cross sectional are of said secondary air passage in response to said control vacuum;

an oxygen sensor disposed in an exhaust passage of said exhaust system;

a discrimination means for discriminating an air/fuel ratio on the basis of an output signal level of said oxygen sensor and producing an air/fuel ratio discrimination signal;

an open/close valve disposed in said secondary air passage for opening and closing said secondary air passage in accordance with said air/fuel ratio discrimination signal;

an intake air temperature sensor for detecting the temperature of an intake air of said engine and producing an intake air temperature signal; and

a control means responsive to said intake air temperature signal, for preventing the supply of the secondary air through said secondary air passage when said intake air temperature is below a predetermined level.

4,495,923

FUEL INJECTION CONTROL SYSTEM

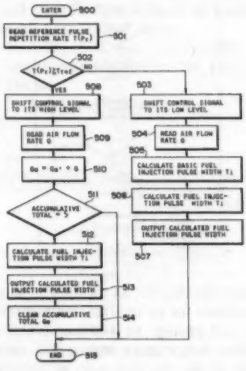
Sadao Takase, and Akio Hosaka, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 18, 1982, Ser. No. 349,867

Claims priority, application Japan, Feb. 20, 1981, 56-23132

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—478 **4 Claims**



1. A fuel injection control system for use in an internal combustion engine having at least one fuel injector, comprising:

an airflow sensor for generating a signal indicative of the flow rate of air to said engine;

a digital computer receiving the engine air flow rate indicative signal from said airflow sensor for reading engine air flow rate values, said digital computer calculating a fuel-injection pulse-width value from the read engine air flow rate values;

a trigger pulse generator for generating a series of trigger pulses at a predetermined constant repetition rate shorter than the period of rotation of said engine at its maximum speeds;

an injection command signal generator for generating an injection command pulse having a pulse width corresponding to the calculated fuel-injection pulse-width value to said fuel injector each time an injection initiation pulse is received; thereby controlling the supply of fuel to said engine;

a reference pulse generator for generating a series of reference pulses in synchronism with engine rotation;

a control signal generator for generating a control signal changeable between low and high levels; and

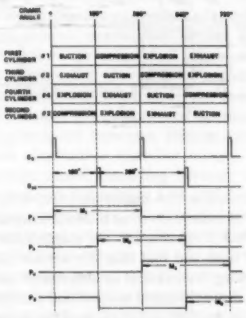
a gate circuit having inputs from said trigger pulse generator and said reference pulse generator, said gate circuit, responsive to a high level control signal from said control signal generator, for passing trigger pulses as said injection initiation pulses from said trigger pulse generator to said injection command signal generator, said gate circuit, responsive to a low level control signal from said control signal generator, for passing reference pulses as said injection initiation pulses from said reference pulse generator to said injection command signal generator;

said digital computer normally reading engine speed values from the reference pulses, calculating the fuel-injection pulse-width value by dividing the read air flow rate value by the read engine speed value, and holding the control signal at its low level, said digital computer changing the control signal to its high level and calculating the fuel-injection pulse-width value by adding a predetermined number of engine air flow rate values successively read at predetermined intervals when a failure occurs in said reference pulse generator or the associated circuit, said predetermined repetition rate of said trigger pulse generator being based on the time interval during which the predetermined number of engine air flow rate values are added.

4,495,924
FUEL INJECTION CONTROL SYSTEM FOR A DIRECT INJECTION TYPE INTERNAL COMBUSTION ENGINE

Takashi Ueno, Yokosuka, and Sadao Takase, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 6, 1983, Ser. No. 482,566
Claims priority, application Japan, Apr. 14, 1982, 57-60989
Int. Cl.³ F02B *3/00*; F02M *51/00*
U.S. Cl. 123—478 **7 Claims**



1. A fuel injection control system for a direct injection type, multi-cylinder, internal combustion engine having a crankshaft, comprising:

(a) a plurality of fuel injection valves, respectively disposed in a combustion chamber of each cylinder of said engine through which an amount of fuel is directly injected into the combustion chamber in response to an associated timed injection signal having a pulse width, the amount of fuel injected varying in accordance with said pulse width;

(b) means for calculating the start timing and pulse width of the injection signal for each fuel injection valve according to current engine operating conditions;

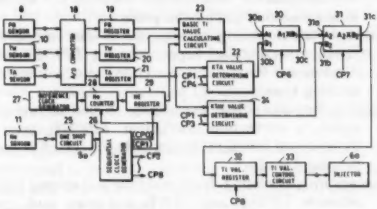
(c) means for producing a plurality of pulse signals, each corresponding to one of said cylinders and having a period extending through a predetermined angle of crankshaft rotation, said period including at least a suction and a compression stroke of the corresponding cylinder and a timing corresponding to a predetermined stroke of said cylinder; and

(d) injection signal producing means associated with each engine cylinder and responsive to said pulse signals for producing and outputting said injection signals based on data calculated by said calculating means and synchronized with said pulse signals, whereby each fuel injection has a duration corresponding to said calculated pulse width and occurs over a period which includes at least the suction and compression strokes of the corresponding cylinder.

4,495,925
DEVICE FOR INTAKE AIR TEMPERATURE-DEPENDENT CORRECTION OF AIR/FUEL RATIO FOR INTERNAL COMBUSTION ENGINES

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,449
Claims priority, application Japan, Nov. 19, 1981, 56-185763
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—480 **7 Claims**



1. In a fuel supply control system for use with an internal combustion engine having an intake pipe and at least one electromagnetically controlled fuel injection valve arranged for injecting fuel into said engine and having a valve opening period thereof adapted to determine a quantity of fuel being supplied to said engine, said system including means for determining a basic value of the valve opening period of said fuel injection valve as a function of at least one parameter representing operating conditions of said engine, to thereby control the air/fuel ratio of an air/fuel mixture being supplied to said engine, an air/fuel ratio correcting device comprising: a sensor for detecting a value of intake air temperature in said intake pipe of said engine; means for arithmetically calculating a value of a correction coefficient as a function of a value of the intake air temperature detected by said sensor; and means for correcting a basic value of the air/fuel ratio of said air/fuel mixture determined by said basic value determining means, by an amount corresponding to a value of said correcting coefficient arithmetically calculated by said arithmetically calculating means: wherein said arithmetically calculating means is adapted to arithmetically calculate the value of said correction coefficient by the following equation:

$$KTA=[(TAO+273)/(TA+273)-1]\times CTA+1$$

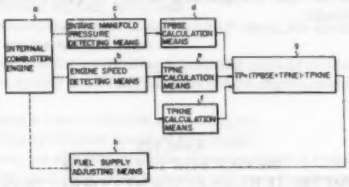
where TA represents a detected value (°C.) of the intake air temperature, TAO a predetermined reference value (°C.) of the intake air temperature, and CTA a constant having a value thereof determined by said engine.

4,495,926

APPARATUS FOR CONTROLLING THE FUEL SUPPLY OF AN INTERNAL COMBUSTION ENGINE

Nobuyuki Kobayashi, and Takashi Hattori, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1983, Ser. No. 566,418
Claims priority, application Japan, Apr. 4, 1983, 58-57779
Int. Cl.[3] F02M 51/02
U.S. Cl. 123—486 5 Claims



1. An apparatus for controlling the fuel supply of an internal combustion engine comprising:

means for detecting the intake manifold pneumatic pressure and producing a first electrical signal;

means for detecting the engine running speed and producing a second electrical signal;

means for calculating, in response to said first electrical signal, a first fuel supply amount TPBSE from at least one one-dimensional function the variable for which is the intake manifold pneumatic pressure;

means for calculating, in response to said second electrical signal, a second fuel supply amount TPNE from a one-dimensional function the variable for which is the engine running speed;

means for calculating, in response to said second electrical signal, a correction coefficient TPKNE from a one-dimensional function the variable for which is the engine running speed;

means for calculating, from said first and second fuel supply amounts TPBSE and TPNE and from said correction coefficient TPKNE, a third fuel supply amount TP, said calculation being performed by using the function $TP=(TPBSE+TPNE)TPKNE$; and

means for adjusting, in accordance with said calculated third fuel supply amount, the actual fuel supply to the engine.

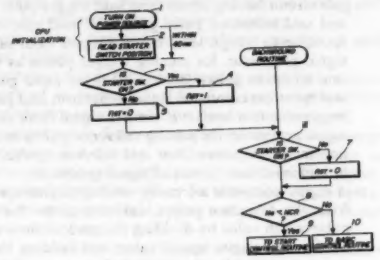
4,495,927

METHOD FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE AT THE START OF SAME

Akihiro Yamato, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 505,069
Claims priority, application Japan, Jun. 18, 1982, 57-104804
Int. Cl.[3] F02N 17/00; F02M 51/00
U.S. Cl. 123—491 11 Claims

1. A method for controlling the operation of an internal combustion engine having an ignition switch and a starter switch, while it is in a starting condition, by means of a control system including a central processing unit which is supplied with an operating voltage from a power source while said ignition switch of said engine is closed, and adapted to normally operate with an operating voltage above a predetermined level, the method comprising the steps of: (1) detecting the value of said operating voltage being supplied from said power source to said central processing unit; (2) initializing said central processing unit when said operating voltage increases above said predetermined level after said ignition switch has been closed; (3) determining whether said starter switch of said engine is in a closed position or in an open position while said central processing unit is being initialized; (4) selecting one of a plurality of predetermined manners of controlling the operation of said engine while it is in said starting condition, depending upon the result of said determination in said step (3); and (5) controlling the operation of said engine while it is in said starting condition, in accordance with said one manner selected in said step (4).

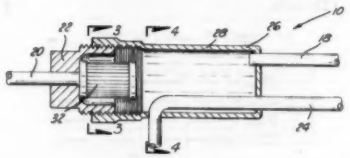


4,495,928

COMBINATION FUEL HEATER AND FUEL FILTER DEVICE

William R. Cook, Rte. #1, Wellington, Kans. 67412

Filed Sep. 8, 1983, Ser. No. 530,420
Int. Cl.[3] F02M 31/00
U.S. Cl. 123—557 2 Claims



1. A combination fuel heater and fuel filter device for improving fuel consumption in an internal combustion engine, the heater and fuel filter adapted for attachment to the engine's water heater hose and fuel line, the device comprising:

a fuel housing, cylindrical in shape and having a first end portion and a threaded second end portion;

a fuel inlet in the first end portion of the housing and adapted for connection to the fuel line and receiving fuel in the housing;

a hot water tube received in the housing and running along the length of the housing, one end of the tube extending outwardly from the first end portion of the housing and adapted for connection to one end of the water heater hose, the other end of the tube extending outwardly from the side of the housing and adapted for connection to the other end of the water heater hose, the diameter of the tube in a range of $\frac{1}{4}$ to $\frac{1}{3}$ of the diameter of the fuel housing for properly heating without vaporizing the fuel before it enters a carburetor of the engine;

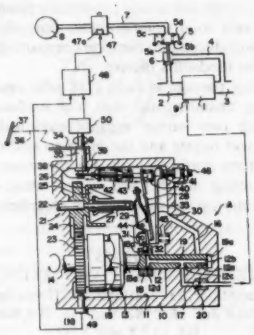
a threaded end cap connected to the threaded second end portion of the housing and having a fuel outlet adapted for connection to the fuel line; and

a fuel filter received inside the threaded end cap.

4,495,929
EXHAUST GAS RECIRCULATION SYSTEM FOR DIESEL ENGINES

Tooru Maeda, and Tsunao Yajima, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 18, 1982, Ser. No. 349,706
Claims priority, application Japan, Feb. 19, 1981, 56/23722
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—569 6 Claims

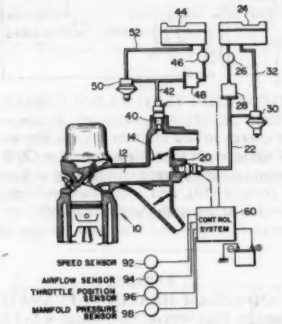


1. A diesel engine comprising combustion chamber means, intake passage means leading to said combustion chamber means, fuel injection nozzle means, fuel injection pump means for providing a supply of fuel to said fuel injection nozzle means said fuel injection pump means including fuel displacing plunger means of variable effective stroke and fuel amount adjusting means for determining the effective stroke of said plunger means, said adjusting means including an adjusting member for adjusting the effective stroke of the plunger means, externally actuatable control lever means adapted to be acutated by an engine control member for forcing the adjusting member in a direction of increasing fuel supply as the engine control member is moved in direction of increasing engine output and engine speed responsive governor means for forcing the adjusting member in a direction of decreasing the fuel supply as the engine speed increases, exhaust passage means leading from said combustion chamber means, exhaust gas recirculation passage means extending between said exhaust and intake passage means for passing a part of the exhaust gas from said exhaust passage means to said intake passage means, control valve means provided in said recirculation passage means for controlling the exhaust gas which is to be passed from the exhaust passage means to said intake passage means, first sensing means for detection the position of the control lever means and producing a lever position signal, second sensing means for detecting the engine speed and producing an engine speed signal, control means adapted to receive said lever position signal and said engine speed signal and actuate said control valve means to close said recirculation passage means in a range beyond a specific value of fuel supply which is determined in accordance with said signals, said control means including transducer means which receives the control lever position signal from the first sensing means and produces a cut-off signal which changes in response to a change in the control lever position so that it becomes equal to the engine speed signal at a predetermined amount of fuel supply which is determined by said adjusting member, comparator means provided in said control means to compare the cut-off signal with the engine speed signal and to produce a valve actuating signal when the engine speed signal is smaller than the cut-off signal to thereby close the control valve means.

4,495,930
FUEL CONTROL SYSTEM

Yasuo Nakajima, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jul. 27, 1981, Ser. No. 287,180
Claims priority, application Japan, Jul. 28, 1980, 55-103314
Int. Cl.³ F02B *75/12*; F02D *19/08*
U.S. Cl. 123—575 23 Claims



1. In an internal combustion engine including an intake passage, a first fuel injector for discharging, into said intake passage, a first kind of fuel having a first calorific value, a second fuel injector for discharging, into said intake passage, a second kind of fuel having a second calorific value different from said first calorific value of said first kind of fuel, said first and second fuel injectors being repeatedly energized to discharge fuel for time periods corresponding to pulse widths of first and second injection command signals applied thereto, respectively, a method controlling the amounts of said first and second kinds of fuel discharged into said intake passage comprising the steps of:

determining a basic pulse width of said first injection command signal to provide a quantity of said first kind of fuel having said first calorific value required for said engine in response to air flow rate to said engine;

determining a ratio between the pulse widths of said first and second injection command signals in response to engine load;

determining the pulse widths of said first and second injection command signals from the determined basic pulse width and the determined pulse width ratio; and

operating said first and second fuel injectors in response to said first and second injection command signals having the predetermined pulse widths, respectively, so that the total of the caloric values of said first and second kinds of fuel discharged corresponds to the caloric value of said quantity of said first kind of fuel corresponding to the determined pulse width of said first injection command signal.

4,495,931
ENGINE IGNITION SYSTEM

Immanuel Krauter, Erbstetten, and Hartmut Schweizer, Korntal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 3, 1983, Ser. No. 520,076
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229202
Int. Cl.³ F02P *1/00, 1/08, 9/00, 3/04*
U.S. Cl. 123—651 6 Claims

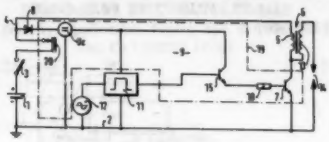
1. An ignition system for internal combustion engines, comprising:

an output switching transistor (7), the emitter-collector path of which is in a series circuit with the primary winding (5) of an ignition coil (6),

control means coupled to the base of said output switching

transistor (7) for supplying switching control current to said base of said output switching transistor (7),

said control means including a constant-current source (9) for supplying said control current at a current level selected such that, during conduction of said emitter-collector path of said output switching transistor for storing



ignition energy in said ignition coil (6), the saturated operation of said output switching transistor (7) is maintained,

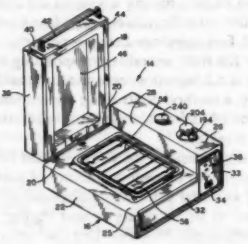
said constant-current source comprising a driver transistor (15), a resistor (10), and a constant-voltage source (U_c) connected in series with the emitter-collector path of said driver transistor (15) and with said resistor (10).

4,495,932

FOOD STEAM HEATING APPARATUS

Ronald E. Bratton, Fort Wayne, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Feb. 3, 1981, Ser. No. 231,249
Int. Cl.³ A21B *1/36*
U.S. Cl. 126—20 **18 Claims**



1. A steam heating device for heating and freshening foodstuffs comprising:

a cabinet,

a heat exchanger assembly mounted in said cabinet and having an upper surface,

a lid connected to said cabinet and enclosing the upper surface of said heat exchanger assembly to form therewith a food compartment adapted for receiving foodstuffs to be heated,

said heat exchanger assembly including a steam generating chamber below the food compartment and having a lower surface, heating element means directly under said chamber for heating the lower surface thereof, and nozzle means for directing water into said chamber on the lower surface thereof, said steam generating chamber lower surface being a substantially flat, continuous surface unobstructed by barriers thereon so that water injected into the steam generating chamber can flow to substantially all areas thereof,

said heat exchanger assembly further including two steam superheating chambers each having a lower surface, the total combined surface area of said steam superheating chambers lower surfaces being much smaller than the surface area of said steam generating chamber lower surface, said generating and superheating chambers communicating through respective throttling passages each having a cross-sectional flow area less than the cross-sectional flow area of the respective superheating chambers in said steam generating chamber, whereby the steam increases in velocity as it enters the throttling passage from the steam generating chamber and expands upon entering the superheating chambers from the throttling passages,

narrow, elongated connecting passages respectively connected directly to said superheating chambers so that steam leaving said superheating chambers directly enters the respective connecting passages, said connecting passages having cross-sectional flow areas that are smaller than the cross sectional flow areas of the respective superheating chambers, and

a plurality of small outlet passages in said heat exchanger assembly connected to said connecting passages and opening into said food compartment, whereby superheated steam is introduced into the food compartment to heat and freshen the foodstuffs therein,

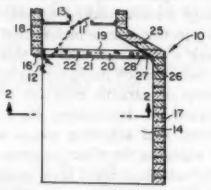
said throttling passage including an inlet opening into the generating chamber, and said heat exchanger assembly comprising two barrier means positioned respectively between said nozzle and the inlets to said throttling passages to form tortuous paths for the steam produced in said generating chamber and prevent water droplets from directly entering the superheating chambers.

4,495,933

FIREPLACE INSERT AND METHOD

Steven E. Schinbeckler, 212 Gaslight La., Greenfield, Ind. 46140

Filed Jul. 26, 1982, Ser. No. 401,846
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—123 **6 Claims**



1. An apparatus for converting a fireplace for use with a stove having a flue, the fireplace having opposed side walls, a back wall, and a front opening defined at the top by a lintel secured to a front wall, said apparatus comprising:

a pair of side wall supports;

first mounting means for mounting each side wall support to one of the side walls of the fireplace;

a back wall support;

second mounting means for mounting said back wall support to the back wall of the fireplace, said side and back wall supports being positioned to form a substantially continuous surface along the side and back walls of the fireplace;

a cover plate including an aperture for reception of the stove flue;

slide attachment means mounted to said side and back wall supports for slidingly receiving said cover plate for supporting said cover plate on said side wall supports, said slide attachment means including S-shaped brackets, said cover plate being received by said slide attachment means and being configured to substantially close the area defined by the front, side and rear walls of the fireplace;

said wall supports comprising L-shaped brackets, the S-shaped brackets defining upper and lower recesses facing in opposite directions, the upper recess receiving a respective one of the L-shaped brackets for securement thereto and the lower recess receiving a respective edge of said cover plate; and

securement means for securing said cover plate to the lintel of the fireplace.

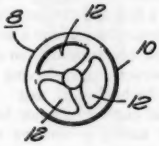
4,495,934
IUD ARRANGEMENT

Seth T. Shaw, Jr., 30036 Via Borica, Rancho Palos Verdes, Calif.

Continuation-in-part of Ser. No. 927,765, Jul. 25, 1978, abandoned, Ser. No. 928,093, Jul. 26, 1978, Pat. No. 4,233,968, and Ser. No. 928,106, Jul. 26, 1978,. This application Jul. 9, 1979, Ser. No. 55,900

Int. Cl.³ A61F *5/46*

U.S. Cl. 128—130 **27 Claims**



1. A medicated intrauterine device of the type insertable into the uterus for retention therein for a predetermined time period and comprising, incombination:

a uterus insertable body member having an external surface adapted to contact the uterus, and said body member comprising a polymer matrix and at least one drug with said polymer matrix and said at least one drug providing an anti-fibrinolytic effect, a reversible anti-fertility effect, and an antiproteolytic effect, and said at least one drug selected from the class consisting of a guanidine and an amidine, and said at least one drug and said polymer matrix selected to provide said at least one drug releasable at a predetermined rate from said body member to the uterus; and

said body member has a predetermined geometrical configuration and said at least one drug is in at least one of a biodegradable polymer an biodegradable copolymer form and is mixed with said polymer matrix.

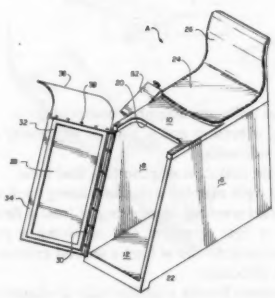
4,495,935
FOOT WARMER

Jack K. Lanier, P.O. Box 6397, Jacksonville, Fla. 32205

Filed Aug. 25, 1983, Ser. No. 526,449

Int. Cl.³ A61F *7/00*

U.S. Cl. 126—204 **10 Claims**



1. A boot and foot warming device for skiers and other outdoor sportsman comprising:

(a) a chamber bounded by a top wall having a front and a rear portion, a bottom wall, a back wall and side walls;

(b) a leg receiving opening in said front portion of said top wall;

(c) said top wall including a seat positioned rearwardly of said leg receiving opening;

(d) a swinging door hinged to said side wall and providing a front wall for said chamber;

(e) an air circulating heater mounted within said chamber;

(f) said bottom wall being sloped for allowing water run-off;

(g) a drain in said sloped bottom wall;

(h) a dividing wall extending transversely through said chamber and engaging said top wall, said bottom wall and said side walls; and

(i) said dividing wall partitioning said chamber into a front chamber and a rear chamber.

4,495,936
FLEXIBLE SOLAR HEAT COLLECTOR

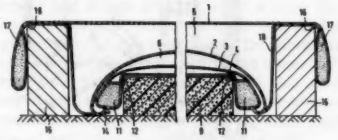
Joachim Frommhold, Popitzweg 13/22/224, 1000 Berlin 13, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,308

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206866

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—426 **4 Claims**



1. A flexible solar heat collector for use in connection with supporting means defining two opposite upright sides, comprising at least two superposed flexible foils joined together along their rims to form a heat collecting chamber therebetween, means for feeding heat carrying medium through said collecting chamber, and pliant tensioning weights provided at two opposite rim portions of at least one of said foils to hang over the edges of said upright sides of the supporting means and to stress the foils by the force of gravity, the two opposite rim portions of said foils being formed with marginal chambers adjoining the foils, and said pliant tensioning weights being provided in said marginal chambers to prevent bulging of the upper foil when internal pressure in the collecting chamber increases.

4,495,937
THERMAL COLLECTOR AND STORAGE SYSTEM

D. Larry Fisher, Harrisonburg, Va., assignor to Sunwood Energy Systems, Inc., Harrisonburg, Va.

Filed Aug. 31, 1981, Ser. No. 298,295

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—430 **10 Claims**

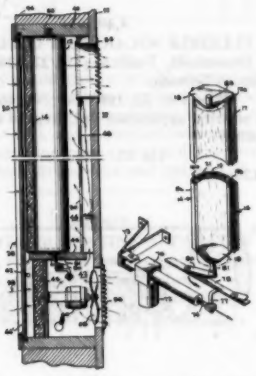
1. Thermal collector and storage apparatus adapted to be disposed within a wall defining at least in part a conditioned space to be heated by solar energy, said apparatus comprising:

(a) enclosure means having an opening to permit solar rays to pass therethrough and a heat exchange chamber;

(b) a plurality of energy storage elements supported by said enclosure means within said heat exchange chamber for receiving said solar rays, each energy storage element containing a phase change material selected to have a solid to liquid transition at a temperature sufficiently above the desired interior housing temperature to permit efficient heat transfer to the conditioned space and a high heat of fusion associated with said transition, said plurality of energy storage elements is disposed in an array with each of said energy storage elements parallel to its adjacent energy storage element, and

(c) a plurality of heat insulating members, each heat insulating member being associated with a corresponding energy storage element and mounted for movement between a first position, wherein said heat insulating members are

disposed between said opening and said plurality of energy storage elements to retard heat loss from said energy storage elements, and a second position wherein the solar rays are permitted to be directed through said opening and onto said plurality of heat energy storage elements, each of said plurality of heat insulating members is configured so that when they are disposed in their second positions there is provided a space between adjacent heat insulating members to permit the solar rays to be directed through said spaces and, thus, directly radiate heat throughout said



heat exchange chamber, adjacent of said insulating members of said plurality are adapted to mate with each other when disposed in their first position to form a substantially continuous insulating barrier between said plurality of energy storage elements and said opening, each of said heat insulating members having at least one leading edge adapted to mate in a heat sealing relationship with an adjacent one of said heat insulating members, when said heat insulating members are disposed to their first positions.

4,495,938

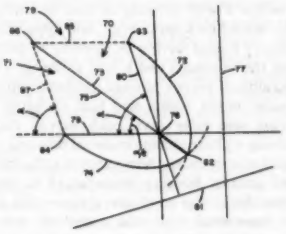
SOLAR ENERGY COLLECTOR

Wallace G. Hanson, Rte. 2, Box 103, Dodge Center, Minn. 55927

Division of Ser. No. 295,749, Aug. 24, 1981, Pat. No. 4,444,176, which is a division of Ser. No. 12,838, Feb. 16, 1979, Pat. No. 4,297,988. This application Dec. 5, 1983, Ser. No. 579,989

Int. Cl.³ F24J 3/02

U.S. Cl. 126—439 **4 Claims**



1. A stationary solar collector fixed with respect to the surface of the earth at a latitude where the maximum solar altitude angle is α, comprising:

an elongated bidirectional energy receiver affixed to the earth and lying along a line substantially in the east-west direction;

a first planar reflector affixed at an angle not greater than $\alpha/2$ relative to the surface of the earth and having two planar reflective surfaces extending from said energy receiver to a predetermined first end;

a second elongated and curved reflector having a parabolic cross section and having a concave reflective surface facing one of said planar reflective surfaces, said second reflector having a focal line lying in a plane aligned with said energy receiver, and having a parabolic surface length defined by a first line of intersection with a planar extension of said first reflector, and a second line of intersection with a plane constructed from said first reflector first end, said constructed plane having a maximum inclination defined by the horizontal; and

a third elongated and curved reflector having a parabolic cross section and having a concave reflective surface facing the other of said planar reflective surfaces, said third reflector having a focal line lying in a plane aligned with said energy receiver, and having a parabolic surface length defined by said first line of intersection with a planar extension of said first reflector, and a second line of intersection with a plane constructed from said first reflector first end at an angle not greater than α relative to the surface of the earth.

4,495,939

SOLAR HEAT COLLECTOR WITH JOINT STRUCTURE

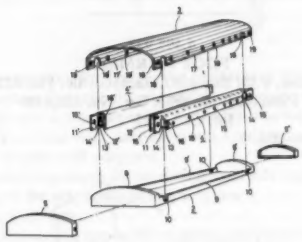
Nobushige Arai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 10, 1982, Ser. No. 440,522

Claims priority, application Japan, Nov. 10, 1981, 56-168169[U]

Int. Cl.³ F24J 3/02

U.S. Cl. 126—450 **14 Claims**



1. A solar heat collector assembly comprising:

a base having a bottom and a pair of oppositely disposed upstanding sidewalls;

at least one heat collector disposed on said base;

a substantially rigid member extending along each said sidewall, each said member comprising at least a first groove opening in a first direction and receiving a respective sidewall therewithin and at least a second groove opening in a second direction;

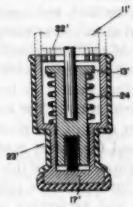
a transparent cover having a substantially U-shaped configuration including oppositely disposed side portions, wherein said side portions are spaced at a distance from each other corresponding to a distance between said second grooves of said members and said cover side portions are positioned within said respective second grooves;

wherein said cover is made of material having air cavities therein serving as heat insulators and said base is made of a heat insulating material, whereby said heat collector is completely enclosed within an insulated chamber.

4,495,940
MASSAGER

Hiroshi Takaishi, 73-2, Uchikaburaki-machi, Sakura-shi, Chiba-ken, Japan

Filed Jun. 9, 1982, Ser. No. 386,654
Int. Cl.³ A61N 23/00
U.S. Cl. 128—55 2 Claims

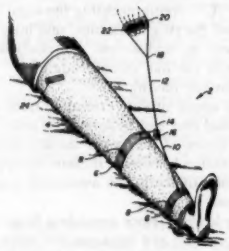


1. A massager comprising:
(A) a variable frequency oscillatory motion drive unit;
(B) an oscillator rod with upper and lower ends; the upper end connected to said drive unit;
(C) an intermediate idler with upper and lower parts and upper and lower axial cavities; the lower end of said oscillator rod fitting fully into and sliding freely within the upper axial cavity of the intermediate idler;
(D) a control spring fitting into the lower axial cavity of said intermediate idler;
(E) a hitting pad with an upper tubular portion; said lower part of said intermediate idler fitting into and sliding freely within the upper tubular portion of the hitting pad; said control spring defining a gap between the hitting pad and said intermediate idler for vibration.

4,495,941
CAST MOVING DEVICE

Kathryn P. Rathvon, and William P. Rathvon, both of 1607 Berkeley Way, Berkeley, Calif. 94703

Filed May 10, 1982, Ser. No. 376,859
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 G 11 Claims

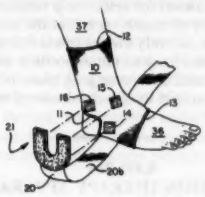


1. A limb maneuvering device for use in positioning a limb of a user comprising:
a flexible line having inner and outer ends;
a cast surrounding the limb;
means for coupling said outer end to said cast;
a handle mounted to said inner end by which the user can position their limb by manipulating said handle; and
means for releasably attaching said handle to a chosen point on said cast, said chosen point within reach of the user.

4,495,942
DYNAMIC ANKLE BRACE

Pasquale M. Palumbo, 906 Frome La., McLean, Va. 22101

Continuation of Ser. No. 327,706, Dec. 4, 1981, abandoned. This application Jan. 31, 1984, Ser. No. 575,532
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 H 10 Claims

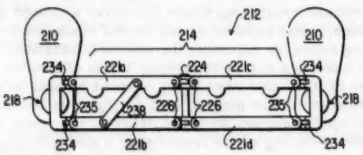


1. A dynamic ankle brace for bracing an ankle of a lower extremity comprising:
a U-shaped pad means adapted to fit around the lateral malleolus of the ankle when said brace is in use for applying pressure to the area surrounding the lateral malleolus;
an elastic strap means, having a first end connected to said U-shaped pad means and a second end, said elastic strap means adapted to be wrapped around the ankle and foot in a predetermined manner, for applying force against said U-shaped pad when said brace is in use; and
means, operably associated with said elastic strap, for releasably holding said elastic strap in the wrapped position when said brace is in use.

4,495,943
ORTHOPEDIC FOOT SPLINT WITH SWIVEL

Robert J. Kurtz, New York, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to Bioresearch, Farmingdale, N.Y.

Continuation of Ser. No. 531,583, Sep. 9, 1983, , which is a continuation of Ser. No. 358,531, Mar. 16, 1982, abandoned. This application May 18, 1984, Ser. No. 611,713
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 A 11 Claims



1. An orthopedic foot splint which is attached to the shoes of a user comprising:
a pair of shoe engaging plates, each said plate having a longitudinal axis approximately parallel to the longitudinal axis of the shoe which is attachable thereto;
an elongate connecting means for horizontally interconnecting said pair of shoe engaging plates, said connecting means including
(a) two elongate sections each of which is pivotally attached at one end to a respective shoe engaging plate, at least one of said two sections being a pair of parallelogram links which are pivotable in a horizontal plane relative to each other and to said shoe engaging plates, and
(b) a central joint means interconnecting the other end of said sections which allows said sections to pivot in a plane relative to one another;
a flexible non-extensible tether attached at an angle to said

parallelogram links such that said links are prevented from pivoting in the horizontal plane beyond a predetermined angle with respect to the longitudinal axis of the adjacent shoe engaging plate but which can pivot in the opposite direction freely; and

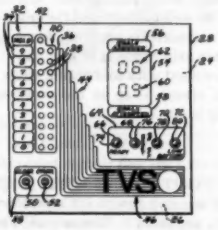
swivel means provided between said connecting means and at least one of said shoe engaging plates for allowing said shoe engaging plate to swivel about a vertical axis with respect to said connecting means, said swivel means including a stop means for selectively restricting the movement of said swivel means such that the toe or heel of the respective shoe can only swivel toward or away from said connecting means from an initial position where the longitudinal axis of said shoe engaging plate is approximately perpendicular to said longitudinal axis of said connecting means.

4,495,944

INHALATION THERAPY APPARATUS

Alfred Brisson, and Christopher Nowacki, both of Arlington Hts., Ill., assignors to Trutek Research, Inc., Arlington Hts., Ill.

Filed Feb. 7, 1983, Ser. No. 464,219
Int. Cl.³ A61B *5/08*
U.S. Cl. 128—725 **4 Claims**



1. Inhalation therapy apparatus comprising a mouthpiece for insertion in patient's mouth for inhalation therethrough and having pneumatic means producing a pneumatic signal corresponding to the volume of air inhaled, and an electric module pneumatically inter-connected with said mouthpiece, said module comprising means for converting said pneumatic signal to electrical information, and display means visible to said patient and comprising means indicating a desired inhalation volume, means adjacent to said desired inhalation volme indicating means for indicating the volume of inhalation attained, said indicating means comprising a pair of parallel adjacent rows of light, said rows being oriented on said module in a vertical rectilinear manner with the lights in one row being horizontally aligned with the lights in the other row, and further including means representing a stair step arrangement with each step respectively being aligned with a pair of lights, one in each of said rows.

4,495,945

BITE BLOCK

Kenneth B. Liegner, 315 Bear Ridge Rd., Pleasantville, N.Y. 10570

Filed Mar. 29, 1982, Ser. No. 362,524
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.26 **2 Claims**

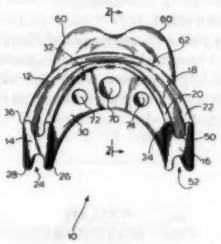
1. A bite block which is useful in conjunction with endoscopy, bronchoscopy, endotracheal intubation and like procedures, which comprises;

(a) a "U" shaped plate having first and second ends, each end being at the terminus of a separate leg of the "U" joined by a bridging section, said plate comprising a plate body intermediate between and joining the first and second ends, said plate body being fabricated from a polymeric resin having sufficient strength to resist biting through but which is resilient enough that injury to the biter's teeth and gums does not occur, said "U" shape plate having (1) an upper surface delineated by the ends and inner and outer marginal zones; (2) a lower surface delineated by the ends and inner and outer marginal zones; (3) an inner side delineated by the ends and upper and lower marginal zones; and (4) an outer side delineated by the ends and upper and lower marginal zones; the inner side joining at its upper marginal zone with the inner marginal zone of the upper surface and at its lower marginal zone with the inner marginal zone of the lower surface; the outer side joining at its upper marginal zone with the outer marginal one of the upper surface and at its lower marginal zone with the outer marginal zone of the lower surface;

(b) a ridge on the outer side of the plate body, positioned between the upper and the lower marginal zones of the outer side at the bridging section of the "U" and extending outwardly from the outer side to a ridge terminus;

(c) an upper flange on and projecting upwardly from the ridge terminus, providing an open space between the upper flange, the upper marginal zone of the outer side and the upper side of the ridge, said space being of a size and configuration to receive the labium superiori oris of a human in sealing engagement with said flange, outer side and ridge;

(d) a lower flange on and projecting downwardly from the ridge terminus, providing an open space between the lower flange, the lower marginal zone of the outer side



and the lower side of the ridge, said space being of a size and configuration to receive the labium inferiori oris of a human in sealing engagement with said lower flange, outer side and ridge;

(e) an open bore traversing the plate and ridge at the bridging section of the "U", communicating between the inner side of the plate and the ridge terminus, said bore being of a dimension to pass an endoscope, a bronchoscope, an endotracheal tube or the like therethrough;

(f) said plate body further having

(1) a groove in the upper surface extending from said first end to said second end and between the inner and the outer marginal zones of the upper surface adapted by size and configuration to receive therein the upper teeth (or, in the absence of teeth, the associated gums) of a human being; and

(2) a groove in the lower surface extending from said first end to said second end and between the inner and the outer marginal zones of the lower surface, adapted by size and configuration to receive therein the lower teeth (or in the absence of teeth, the associated gums) of a human being; whereby when the plate is inserted into the vestibulum oris of a human being, the upper teeth or gums will be received in the upper surface groove and held apart by the plate body from the lower teeth or gums which are received in the lower surface groove; said groove in the upper surface and said groove in the lower surface each defining a smooth inside surface and subtending an acute angle in relation to each other, the

apex of said angle being directed toward the first and second ends of the "U";

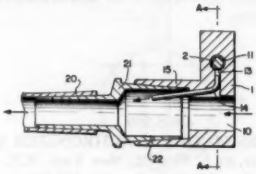
(g) at least one additional open bore traversing the plate and ridge adjacent to the bridging section of the "U", communicating between the inner side of the plate and the ridge terminus, said additional bore being of a dimension to pass an endotracheal tube, oropharyngeal or orogastric tube; said bite block being of a size and configuration permitting insertion of the "U" shaped plate component into the vertibulum oris of a human as described above and whereby the ridge and flange components sealingly engage the labium oris so that the oral cavity is restricted to communication to the exterior through the bore and optional bores.

4,495,946

ARTIFICIAL BREATHING DEVICE

Joseph Lemer, 15 Bracha-Habas St., Haifa, Israel 33393

Filed Mar. 17, 1981, Ser. No. 244,751
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.25 **7 Claims**



1. A device for artificial respiration adapted to introduce predetermined quantities of air or oxygen into the lungs at predetermined intervals, comprising: an automatic time-cycled source of air or oxygen; a valve housing containing an inlet passage connected to said time-cycled source of compressed air or oxygen; a manually adjustable regulating valve mounted within said inlet passage to throttle said inlet opening and to be manually adjusted to the required air or oxygen quantity; and an air duct perforating said valve housing distanced from said regulating valve and having its one end open to the atmosphere during the introduction of said respirating gas into said lungs, while its other end is provided with means for attaching to it a patient; a rigid, small bore tube having one end connected to said air duct and an opposite end connected to said passage downstream said regulating valve, said tube entering said air duct downstream of said regulating valve and extending close to the wall of said air duct with its open end directed in the direction of said attaching means, said small bore tube being dimensioned such that a venturi effect is created when said compressed air or oxygen passes through said small bore tube, whereby said timed-cycled source forces air or oxygen through said small bore tube creating a venturi effect drawing atmospheric air into said duct through said open end and forcing a mixture of said atmospheric air and said air or oxygen from said source into the lungs of said patient.

4,495,947

HIGH SPEED MEDICAL VENTILATOR

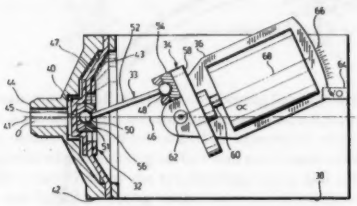
Jiri Motycka, Etobicoke, Canada, assignor to Imasco-CDC Research Foundation, Toronto, Canada

Filed Sep. 23, 1982, Ser. No. 421,894
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—205.14 **15 Claims**

6. A high frequency medical ventilator for converting rotary motion about a rotary axis to reciprocatory motion along a fixed reciprocation axis inclined to said rotary axis comprising:

a support frame defining a longitudinally extending reciprocating axis,

a motor having an output shaft rotatable about a longitudinally extending rotary axis, a swash plate mounted on said output shaft, said swash plate being mounted normally to said output shaft, a chamber mounted on said support frame having an open end and outlet means adapted to be connected to patient breathing circuitry, a reciprocating diaphragm for establishing ventilation mounted on said open end, said chamber being oriented such that said diaphragm reciprocates along said reciprocating axis, linkage means for interconnecting said swash plate with said reciprocating diaphragm and having opposite ends, said swash plate having first connector means eccentrically mounted thereto and rotatable in a plane parallel to said swash plate, one end of said linkage means being connected to said first connector means, said reciprocating diaphragm having second connector means mounted centrally thereof, the opposite end of said linkage means being connected to said second connector means, said first and second connector means permitting universal move-



ment of said opposite ends therewith whereby a component of reciprocating motion developed at said swash plate is transferred to said reciprocating diaphragm, and

said motor being pivotally mounted to said support means about a pivot located at the intersection of said reciprocating axis and the plane in which said first connector rotates such that pivoting said motor pivots said swash plate and shaft as a unit and varies the angle of inclination of the rotary axis to the reciprocating axis,

said linkage means comprising ball joint means including a first bearing housing connected to said swash plate for rotation therewith, and a second bearing housing connected to said diaphragm for reciprocatory motion therewith and first and second spherical bearings being connected by a rod, said first spherical bearing being bearingly mounted in said first bearing housing, and said second spherical bearing being bearingly mounted in said second bearing housing.

4,495,948

TRACHEAL TUBES

Seymour W. Shapiro, Lowell, Ind., assignor to Bivona Surgical Instruments, Inc., Gary, Ind.

Filed Aug. 10, 1981, Ser. No. 291,322
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—207.15 **9 Claims**

1. A tracheal tube comprising

a. a first elongated tube having an outer surface, a proximal end and a distal end,

b. a cuff mounted on said first elongated tube adjacent to said distal end and in spaced relation to said proximal end,

c. said cuff comprising

(1) a flexible tubular cover

(a) disposed on said first elongated tube in surrounding relation thereto, and

(b) having its ends secured to said outer surface, and

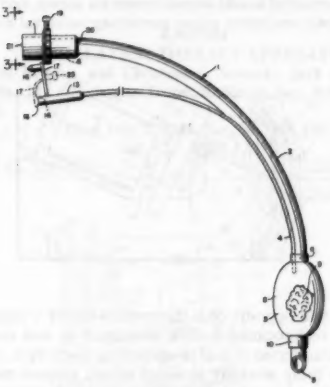
(2) a resilient body portion mounted in said cover,

d. said body portion having

(1) normally an expanded position wherein it is effective to hold a portion of said cover outwardly away from said first elongated tube, and

(2) a collapsed position wherein the outer surface thereof is disposed closer to said first elongated tube than in said expanded position to thereby permit said portion of said cover to assume a position closer to said first elongated tube,

e. means for delivering positive and negative pressures, respectively, to the interior of said cover whereby when a negative pressure is delivered, said body portion moves toward said collapsed position and when said negative pressure is removed, said body portion moves toward said expanded position, said delivery means having first connection means adapted to be connected to positive and negative pressures, respectively, and



f. second connection means having one end fluidically connected directly to the interior of said first elongated tube and an opposite end adapted to be connected to said first connection means and whereby said first connection means is first connected to a negative pressure to collapse said body portion to permit insertion of said tracheal tube into a trachea, disconnected to permit expansion of said body portion within said trachea and subsequently connected to said second connection means to communicate the pressure in the interior of said first elongated tube to the interior of said cover.

4,495,949

TRANSILLUMINATION METHOD

Milton Stoller, West Hartford, Conn., assignor to Spectrascan, Inc., So. Windsor, Conn.

Division of Ser. No. 399,866, Jul. 19, 1982, Pat. No. 4,467,812. This application Jun. 13, 1984, Ser. No. 620,272

Int. Cl.³ A61B 6/12

U.S. Cl. 128—664 **11 Claims**

1. A non-invasive and non-destructive examination method comprising the steps of:

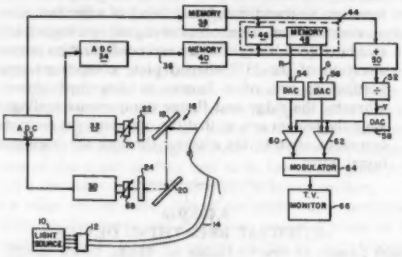
illuminating the object to be examined with light comprising at least two different wavelengths;

detecting light at each of said at least two different wavelengths which has passed through the illuminated object;

recording information commensurate with the intensity of the detected light at each of said at least two different wavelengths, the information commensurate with the same points in the illuminated object being recorded at simultaneously readable locations;

storing display correlated data values for each of a plurality of ratios of the information commensurate with the detected light at each of said at least two different wavelengths which may be recorded;

employing said recorded information for the same points in the illuminated object to select stored display correlated data values; and



employing the thus selected display correlated data values read to produce a display which represents the absorption characteristics of the object at the said at least two different wavelengths.

4,495,950

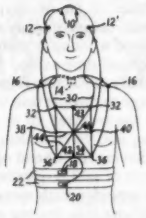
QREEG PROCESS MATRIX SYNCHRONIZER SYSTEM

Daniel E. Schneider, 61 E. 93rd St., New York, N.Y. 10028

Filed Jan. 21, 1983, Ser. No. 460,094

Int. Cl.³ A61B 5/04

U.S. Cl. 128—670 **9 Claims**



1. A system, comprising:

(a) electrode means for obtaining—under the aegis of a "master" QREEG tracing signal—at least EEG and EKG simultaneous and synchronized life-process data signals from a person's body;

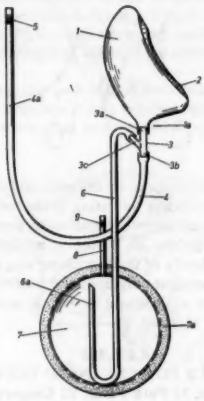
(b) controllable QREEG matrix synchronizer means supported on the person's body for collecting the life-process data signals from the electrode means in separate channels as determined by the control of the matrix, wherein the controllable matrix means comprises means for combining the EEG and EKG signals to provide a QREEG signal on one channel and for providing the EKG signal on another channel; and

(c) signal processor means for processing the life-process data signals on the separate channels from the controllable matrix means, wherein the signal processor means comprises means operative on the QREEG signal in the one channel for detecting the QR wave peaks of the QREEG signal, means responsive to the detected QR wave peaks for counting the alpha wave in the QREEG signal following each QR wave peak and interposed between any two QR peaks, and means operative on the EKG signal in the other channel for identifying a portion of the EKG signal occurring at a predetermined count of the alpha waves in the QREEG signal.

4,495,951
APPARATUS FOR SEPARATELY CATCHING SUCCESSIVE STREAMS OF URINE AT TAKING SAMPLES TO LABORATORIAL AND BACTERIOLOGICAL EXAMINATION

Rajko Kenda, Prazakova 6, 61000 Ljubljana, Yugoslavia

Filed Oct. 14, 1981, Ser. No. 311,316
Int. Cl.[3] A61F 5/44; A61M 1/00
U.S. Cl. 128—762 3 Claims



1. Apparatus for separately catching and retaining successive parts of a stream of urine for taking samples for laboratorial and bacteriological examination, said apparatus adapted for use with a seated patient and comprising:

adapter means for catching a stream of urine and including an adapter outlet;

separating means for automatic separation of the initial, the medial and the final (approximately 2 cc) parts of the urine stream that is caught, said separating means including a first chamber means for receiving and retaining an initial part of the urine stream and accumulating vessel means for receiving and collecting a medial part of the urine stream, flexible tube means providing communication between said adapter means and said accumulating vessel means, said medial stream passing directly from said adapter means through said flexible tube means to said accumulating vessel, said flexible tube means comprising a flexible tube having an upwardly directed free end extending within said accumulating vessel and another end connected to the adapter outlet by an upwardly inclined branch of a connecting piece positioned between said adapter means and said first chamber means, said flexible tube means also serving to receive and retain the final part of the urine stream; and

said accumulating vessel means for receiving and retaining the medial part of the urine stream serving as a transporting means between the patient and a laboratory.

4,495,952
APPARATUS FOR MEASURING JAW MOVEMENT

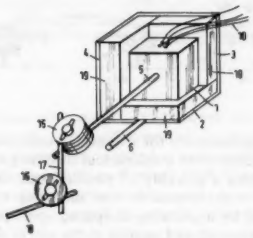
Rolf Klett, Nikolaushöhe 15a, D-8702 Gerbrunn, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 371,578
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117174; Jul. 8, 1981, 3126911
Int. Cl.[3] A61B 5/10
U.S. Cl. 128—777 9 Claims

1. In an apparatus for the contactless measuring of movements of the jaw and of the condyle in the temporo-mandibular joint, respectively, comprising:

optoelectronic signal transmitters and signal receivers, between which light signals are transmitted, part of the apparatus being adapted to be secured to the lower jaw of the patient;

the improvement wherein the apparatus comprises a measuring head mounting said transmitters and receivers, measuring plates extending in three intersecting planes each having a reflecting surface positioned facing said measuring head;

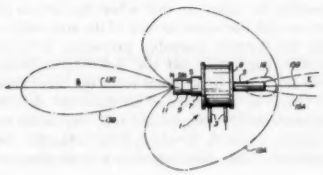


said transmitters and receivers comprising for each orthogonal direction a light transmitting means and a light receiving means mounted on said head adjacent to each other opposite each reflecting surface and positioned so that the light transmitted by the transmitting means and reflected by the facing reflecting surface is received by the receiving means.

4,495,953
APPARATUS AND METHOD FOR PRODUCING AND USING DIRECTIONAL, ELECTRICAL AND MAGNETIC FIELDS

Paul F. Bennewitz, 1413 Wagontrain, SE., Albuquerque, N. Mex. 87123

Filed Dec. 15, 1981, Ser. No. 331,020
Int. Cl.[3] A61N 1/36
U.S. Cl. 128—789 25 Claims



1. A method for producing an extending, highly directional electrical field, said method comprising the steps of:

(a) placing a plurality of magnets end to end so that opposite poles of the respective adjacent magnets are adjacent; and

(b) positioning a paramagnetic flux concentrating element having first and second ends and a longitudinal axis so that the longitudinal axis is approximately aligned with the axes of said plurality of magnets and said first end of the flux concentrating element is located a predetermined distance from the closest magnet, said positioning of said flux concentrating element causing a directional electric field to extend outwardly from said second end of the flux concentrating element and beyond a magnetic field produced by said magnets and said flux concentrating element, the directional electric field decreasing approximately linearly along a line colinear with the axis of said flux concentrating element.

4,495,954
THRESHING CONCAVE FILLER STRIP RETAINER

Don L. Yarbrough, Coal Valley, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 15, 1984, Ser. No. 610,536
Int. Cl.³ A01F *12/18, 12/28*
U.S. Cl. 130—27 K 5 Claims

1. A filler strip assembly for a threshing concave of the type used in cooperation with a cylindrical threshing cylinder, the concave including a plurality of parallel rods extending circumferentially with respect to the threshing cylinder and cross-connected by a plurality of spaced apart parallel grate bars normal to the rods and parallel to the axis of the threshing cylinder and presenting threshing portions projecting above the rods and thus defining elongated axially extending recesses, the filler strip assembly being supportable by the rods in one of the recesses and partially filling said recess to limit the passage of crop material outwards through the concave and comprising:

an elongated filler strip having an inner surface and an opposite generally parallel outer surface for being engaged by the rods and at least one through hole connecting said inner and outer surfaces; and

a fastener assembly for attachment to the filler strip including;

a shank for passing through the hole in the filler strip;

an inner shoulder member carried by the shank for abutting the inner surface of the filler strip;

a deformable body threadable onto the shank for abutting the outer surface of the filler strip;

an outer shoulder member carried by the shank and having a shoulder face for abutting the deformable body member so that, in assembly, the body and the filler strip are contained between the respective opposed shoulder faces; and

means responsive to manipulation of the inner shoulder member for biasing the shoulder members axially one towards the other, so that when the strip is placed in the recess with the outer surface of the strip adjacent the rods and the fastener assembly extending between a pair of neighboring rods, and the deformable body extending between a pair of adjacent rods, the inner shoulder member may be manipulated so that the deformable body becomes axially compressed and, responsive to such compression, expands to engage the adjacent rods so as to secure the filler strip assembly to the concave.

4,495,955
WINDING DEVICE

Wilhelmus P. L. Boogers, Eindhoven, Netherlands, assignor to P.M.B. Patent Machinebouw B.V., Best, Netherlands

Filed Jun. 24, 1981, Ser. No. 276,788
Claims priority, application Netherlands, Jul. 11, 1980, 8004023
Int. Cl.³ A24C *1/28, 1/02*
U.S. Cl. 131—105 10 Claims

8. A device for storing tobacco leaves or portions thereof in sandwiched relation between the windings of a belt, comprising a table having a rounded side edge, a driven roller disposed parallel to and above said rounded side edge of the table, a take-up reel upon which a belt is to be wound, means mounting said reel parallel to said rounded edge and to said driven roller for movement toward and away therefrom and for free rotation about an axis parallel thereto, supply means for issuing a belt flatwise over said table, beneath said roller and over said rounded edge and onto said take-up reel, said means mounting the reel including mechanism yieldably urging said reel toward the driven roller and said rounded edge of the table whereby to press an outermost winding of the belt on said take-up reel continuously against said driven roller, said driven roller being rotatably driven to effect winding of the belt on said take-up reel such that said belt passes over said rounded edge of the

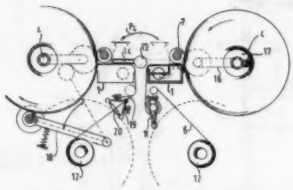
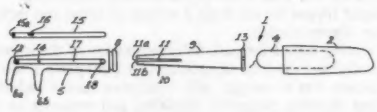


table and downardly to form, on the reel, said outermost winding and said supply means including brake mechanism which tensions said belt and therefore said outermost winding to a selected degree whereby all of the windings are uniformly tensioned independently of the increasing size of the windings on the reel and dependent only upon the frictional engagement of said driven roller against said outermost winding.

4,495,956
DEVICE FOR CLEANING TEETH

Phillippus J. Fourie, 34 Park Plaza, 21 Gregory Ave., Melrose North, Johannesburg, South Africa 2196

Filed Sep. 28, 1982, Ser. No. 426,131
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—92 R 11 Claims



1. A device for cleaning teeth comprising: a housing adapted to house a quantity of dental floss; a locking member having at least one aperture therein; and a formation adapted to support a span of the dental floss; said housing being defined by a housing member, and said formation comprising a fork formation provided on a fork member, and said housing member and fork member being rotatable relative to one another about the longitudinal axis of the device; said formation having at least one aperture therein such that floss from said housing, in an operative position, passes through said aperture and said formation, and thereafter forms the span of floss; and wherein in said operative position the floss from said housing also passes through said aperture in said locking member; and wherein said at least one aperture in said formation comprises at least one hole through the fork member, the aperture in the locking member comprising a slot therein located along its axis, the slot in said operative position being in registry with said at least one hole through said fork member.

4,495,957
FLOSSING DEVICE

George Beggs, 1740 Spruce La., and Thomas H. Richardson, 610 Southerncross Dr., both of Colorado Springs, Colo. 80906

Filed Nov. 5, 1982, Ser. No. 439,537
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—92 A 21 Claims

1. A flossing device comprising:

a body having a handle portion dimensioned for grasping by one hand of the user, and a barrel portion having a rear end extending from one end of said handle portion, the

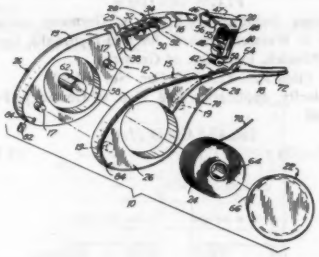
free end of said barrel portion comprising a pair of prongs defining a space therebetween;

means for securing a spool of floss to said body for rotation relative thereto;

said body defining a path for said floss from said securing means, over a surface portion of said body, across said space between said prongs, and back over said body surface portion, said body having a vertically extending bore therethrough at the rear end of said barrel portion and adjacent said surface portion;

a trigger member disposed in said bore, said trigger member including a portion defining a trigger surface, an upper part protruding through the upper end of said bore, and a lower part protruding through the lower end of said bore; and

means for securing said trigger member to said body for movement between a first position wherein said trigger surface contacts said body surface portion for securing



both lengths of floss passing over said body surface portion against movement thereby tensioning the floss extending across said space between said prongs, and a second position wherein said trigger surface is spaced from said body surface portion for accommodating advancement of said floss for disposing a clean length of floss across said space by pulling on the free floss end with the other hand, said trigger member being movable between said two positions by pushing on the upper and lower parts of said trigger member, the positioning of said bore at the rear end of said barrel acommodating use of the thumb of said user's one hand for pushing on the upper part of said trigger member and the use of another finger on said user's one hand for pushing on the lower part of said trigger member, said trigger member thereby being movable between said two positions by the fingers of said user's one hand while said one hand is simultaneously holding said flossing device by grasping said handle portion.

4,495,958

MEDICATION DISPENSER

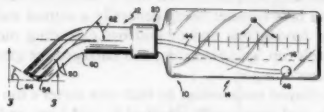
Malcholm O. Roeder, 414 E. Mill St., Danville, Ind. 46122

Filed Feb. 22, 1983, Ser. No. 468,388

Int. Cl.[3] **A45D** *24/26*

U.S. Cl. 132—113 **24 Claims**

1. A dispenser for dispensing medication or the like onto animals comprising a head, a medication container, means for removably coupling the head to the container to permit flow of medication or the like from the container to the head when the container is coupled to the head and to permit recharging or replacement of the container when it is removed from the head, means providing a removable orifice having therein an inner surface around an interior fluid chamber for selectively regulating flow of medication or the like from the container through the head via the fluid chamber, a plurality of teeth extending from the head defining channels for the passage of medication or the like onto the animal, and means for coupling the fluid chamber to the channels comprising means defining a



plurality of separate passageways between the fluid chamber and the channels, the orifice-providing means comprising orifice inserts removably received in the passageways to regulate the flow of medication through each channel separately, each insert having an outer surface acting in conjunction with the inner surface to provide means for collecting sediment of the like.

4,495,959

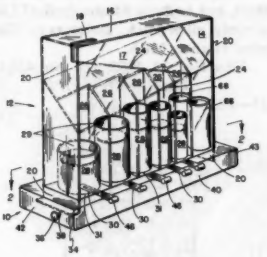
COIN COUNTING DEVICE

Hobart A. Farber, Luther Crest, Apt. 324, 800 Hausman Rd., Allentown, Pa. 18104

Filed Dec. 23, 1983, Ser. No. 564,690

Int. Cl.[3] **G07D** *3/04;* **B65B** *5/00*

U.S. Cl. 133—1 A **3 Claims**



1. A device for counting coins to be used in conjunction with a compartmentalized coin sorter, said device comprising:

(a) a generally parallelpipedal, hollow base of a size to receive an open bottom end of a coin sorter on said base's top, said base including also side walls, a compartment forming wall, back and front walls and a partially open bottom;

(b) at least one tube compartment of a size to hold a coin receiving tube, said compartment(s) extending vertically from said sorter, through said base's top, each defining an opening in said base's top, said compartments placed between a first side wall to said compartment forming wall;

(c) a plurality of coin receiving tubes, each open at one end and each sized circumferentially to receive coins of a different given denomination in stacked relationship, said tubes being removably mounted in said sorter's compartment(s);

(d) tube retaining means in said base to prevent said tube(s) from dropping from said compartment(s) through said base's bottom opening, said tube retaining means including:

(i) at least one transverse channel in said base's top from said front wall to said compartment openings to receive a tube retainer, said channel including a pin and a

washer, said pin extending vertically through each slot so that said tube retainer(s) may not be completely removed from said slot(s), said washer placed between said pin and said retainer to hold said retainer level;

(ii) a tube retainer slidably mounted in each of said channels and out of a length to extend horizontally through said channel(s) and across said tube compartment's(s') base end, supporting said tube's closed bottom thereon, said tube retainer being generally a slotted rectangular bar having one end of said bar extending out of said base's top, said extending end enlarged for grasping by a user's finger;

(e) a U-shaped encasement on said coin sorter's top and side walls, said encasement attached to said base; and,

(f) means to lock said tube(s) in said base, said locking means including:

(i) a locking rod slidably and removably mounted through said base's first side wall, into an aperture in said compartment forming wall, said rod's one end ending in an eye; and,

(ii) an eye bolt located on said first side wall proximate said rod's entrance opening so that a lock may be placed through said eye bolt and said rod's eye to secure said device,

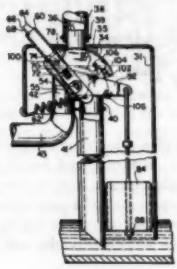
so that when said locking means is removed and said tube retaining means is withdrawn, said coin receiving tube falls through said base's bottom opening.

4,495,960

SUDS RETURN VALVE FOR AUTOMATIC WASHERS

Roger J. Cartier, St. Joseph Township, Berrien County; Victor W. Cuthbert, and Anthony Mason, both of Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 24, 1982, Ser. No. 423,175
Int. Cl.³ F16K *31/18*
U.S. Cl. 137—122 **12 Claims**



1. For use with an automatic washing machine operable through a sequence of washing operations in a wash cycle and a wash tub having a liquid storage receptacle and a drain, a suds return valve for returning wash liquid removed from said machine in a latter wash cycle, said suds return valve comprising:

a housing having a valve body, said valve body having a single inlet in liquid communication with said machine for receiving and returning washing liquid and two outlets, a first of said outlets communicating with said storage receptacle, a second of said outlets communicating with said drain,

a flapper valve means in said valve body operative to alternatively close said first outlet in first position and said second outlet in a second position,

means to normally hold said flapper valve in said first position,

means to manually position and retain said flapper valve in said second position,

float means vertically movable in response to the level of liquid in said storage receptacle and pivotally connected to a rotatable sector cam said sector cam rotated by the vertical movement of said float means and having means for automatically releasing said flapper valve retaining means fo return said flapper valve to said first position during said wash cycle upon a sufficient rotation of said sector cam, and

means for manually releasing said flapper valve to return to said first position,

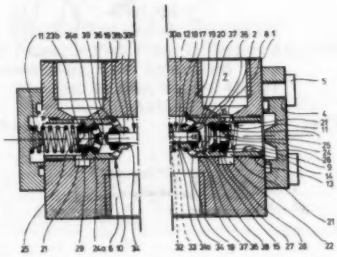
whereby wash liquid passing through said valve body passes through either said first outlet or said second outlet depending on the position of said flapper valve.

4,495,961

FLOW DIVIDER

Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co., KG, Munich, Fed. Rep. of Germany

Filed Feb. 11, 1983, Ser. No. 465,805
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205368
Int. Cl.³ G05D *11/02*
U.S. Cl. 137—101 **15 Claims**



1. A flow divider for carrying out a load-independent division of a stream of hydraulic fluid, comprising a basic body including an internal bore, a central main connection and two outer consumer connections leading to said internal bore and further comprising two approximately coaxial control pistons (**9, 10**) wich are displaceably guided in said internal bore and which are each provided with a flow orifice and with at least one radial control opening, said control pistons being connected by a coupling device such that they can be moved towards each other and away from each other to a limited extent, characterized in that the support areas between the coupling device (**30*a***, **30*b***) and the two control pistons are, respectively, substantially complemental concave and convex support areas, and further characterized in that the coupling device (**30*a***) is an element (**31*a***) which engages both control pistons and which, adjacent each respective free end thereof, is designed as a ball and socket joint part in combination with the respective control piston.

4,495,962

FLUID CONTROL VALVE

Noboru Hattori, Yokosuka, and Yoshitomo Suzuki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 17, 1983, Ser. No. 458,328
Claims priority, application Japan, Mar. 23, 1982, 57-46118
Int. Cl.³ G05D *11/03*
U.S. Cl. 137—117 **4 Claims**

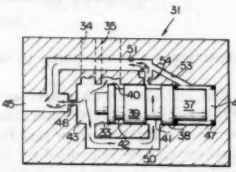
1. A fluid control valve assembly for use in a hydraulic system, the fluid control valve assembly being provided be-

tween the hydraulic system and a fluid feed pump having suction and discharge ports, comprising:

a valve body having a valve cavity extending axially thereof and fluid inlet and outlet ports communicating respectively with said discharge and suction ports of said fluid feed pump;

a valve spool received in said valve cavity and having at least one annular groove formed therein, said valve body and the valve spool defining in combination in the valve cavity high-pressure and low-pressure chambers axially spaced apart from each other across the valve spool, said high-pressure chamber being held in communication with said fluid inlet port, said valve spool being axially movable between a first axial position where said valve spool closes said fluid outlet port to block communication between said fluid inlet and outlet ports and a second axial position where said valve spool opens said fluid outlet port to provide communication between said fluid inlet and outlet ports;

biasing means for biasing said valve spool toward said high-pressure chamber; and



stop means for stopping said valve spool against the biasing force of said biasing means and having said valve spool held at the first axial position;

said valve body further having a discharge passageway held in communication with said high-pressure chamber through an orifice passageway, a first fluid control passageway having an upstream end open to said high-pressure chamber and a downstream end open to said annular groove of said valve spool, a second fluid control passageway having an upstream end and a downstream end open to said discharge passageway, and a third fluid control passageway having one end held in communication with the upstream end of said second fluid control passageway and the other end open to said low-pressure chamber;

wherein said valve body is formed with a flow restriction passageway having one end held in communication with the upstream end of said second fluid control passageway and the other end communicating with said annular groove of said valve spool when the valve spool is held at the first axial position thereof.

4,495,963

REMOTELY ACTUATED OIL DRAIN FOR MOTOR VEHICLES

William H. Hensley, 6745 E. Boston St., Mesa, Ariz. 85205

Filed Jan. 31, 1983, Ser. No. 462,219

Int. Cl.³ F16L *3/00*

U.S. Cl. 137—351 **8 Claims**

1. Apparatus mounted within the engine compartment of a motor vehicle for the remote actuation of a drain valve for the engine crankcase of said motor vehicle which comprises:

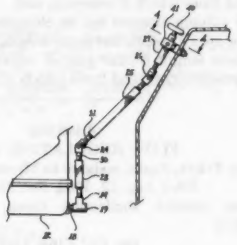
(a) valve means having an extension adapted for insertion into a crankcase, said valve means having an actuating stem extending outwardly of said crankcase, the rotation of said stem actuating said valve;

(b) a first universal joint coupled to said valve stem for imparting rotation thereto;

(c) means for connecting said first U-joint to the portion of said valve stem extending outwardly of said crankcase;

(d) a first rigid motion translating arm having first and second ends, said first end being secured to said first universal joint; and

(e) receiving means mounted within the engine compartment of said motor vehicle remote from said crankcase for



removably receiving the second end of said arm and preventing rotation thereof, the removal of said arm from the receiving means and the rotation thereof actuating said valve means to permit the remote draining of the engine crankcase.

4,495,964

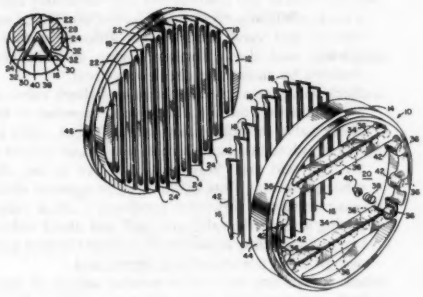
UNIDIRECTIONAL-FLOW FLUID VALVE

Robert A. Bennitt, Corning, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 12, 1983, Ser. No. 493,994

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—512.1 **17 Claims**



9. A unidirectional-flow, fluid valve, comprising:

a valve seat; and

a stop plate; wherein

said seat and plate are in coupled engagement;

said seat has pluralities of openings formed therethrough;

said plate has a void formed therewithin; and

valving means, interposed between said seat and said plate, operative, in response to pressured fluid addressed thereto, for opening and closing communication between said openings and said void; wherein

said valving means comprises a plurality of individual valving elements;

said valve seat has a plurality of lands;

each of said lands is intermediate a pair of said openings;

said elements each have a given surface which closes upon, and removes from, a given one of said lands;

said lands are of angular cross-section;

each of said valving elements is of a substantially right-angular, channel configuration, having an apex and integral walls divergent from said apex; and

said apexes of said valving elements sealingly nest in, and remove from, said lands;

each pair of said openings is of a given length;

each valving element has a length which is greater than such given length of the pair of openings upon which it closes, and from which it removes; and

each valving element has an elongated aperture, formed in the apex thereof, having a length corresponding to said given length of the pair of openings upon which said element closes, and from which it removes.

4,495,965
FLOW REGULATING VALVE

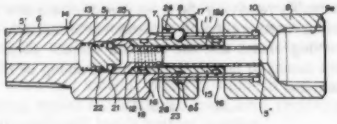
Yoji Ise, Tokyo, Japan, assignor to Myotoku Ltd., Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,909

Claims priority, application Japan, Aug. 21, 1981, 56-123866[U]

Int. Cl.³ F16K *11/10*

U.S. Cl. 137—599 **9 Claims**



1. A flow regulating valve comprising an elongate cylindrical valve body having an axial bore with ports at opposite ends opening into said bore, means for connecting opposite ends of said valve body respectively to fluid flow lines,

a valve member axially slidable in said axial bore of said valve body and having an axial bore,

a sleeve fixed in said axial bore of said valve body and having a portion slidably received in an end portion of said axial bore of said valve member and grooved with a helical groove, said sleeve further having an axial bore surrounded by an annular check valve seat,

a check valve member seatable on said check valve seat and a spring acting on said check valve member to bias said check valve member to seat on said check valve seat and thereby close said axial bore of said sleeve to flow of fluid through said axial bore of said sleeve in one direction while permitting flow of fluid in the opposite direction,

means providing a flow path bypassing a check valve comprising said check valve seat and said check valve member, and including in said flow path said helical groove of said grooved portion of said sleeve, and

means for moving said valve member axially of said valve body and positioning it to embrace and thereby cover a selected portion of said helically groove portion of said sleeve so as to vary the flow resistance of said helical groove,

whereby said flow regulating valve permits free flow of fluid in a direction to open said check valve and regulates flow of fluid in the opposite direction by the position of said valve body relative to said sleeve.

4,495,966
SEPARABLE HIGH VACUUM VALVE

Robert G. Longamore, Newbury Park, Calif., assignor to Electron Beam Corporation, San Diego, Calif.

Filed May 24, 1982, Ser. No. 381,646

Int. Cl.³ F16L *37/28*; F16K *25/00*

U.S. Cl. 137—614.01 **10 Claims**

1. Apparatus permitting separation or assembly of two vacuum chambers without breaking the vacuum on either chamber, said apparatus comprising:

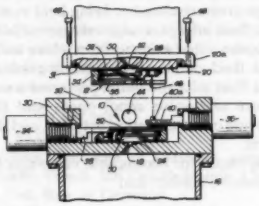
a first valve permanently attachable to a first vacuum chamber to seal an opening therein;

a second valve permanently attachable to a second vacuum chamber to seal an opening therein;

a valve housing extending around said first and second valves;

means for sealing said valve housing against said vacuum chambers to form a valve lock chamber between said first and second vacuum chambers;

actuating means for opening and closing said first and second valves, said actuating means being operable while said valve lock chamber is attached to said vacuum chambers and while said valve lock chamber is evacuated; and



means for connecting a vacuum pump to said valve lock chamber;

whereby the first and second chambers are separable by closing said first and second valves and venting said valve lock chamber to the atmosphere or said first and second vacuum chambers may be assembled by connecting said vacuum chambers to said valve lock chamber, evacuating said valve lock chamber and opening said first and second valves.

4,495,967
FLUID INJECTORS

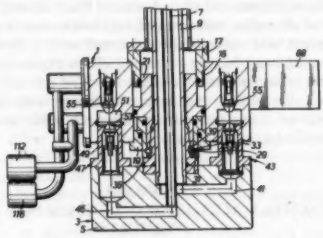
Arthur M. Needham, Surrey, and Laurie E. Helyer, Berkshire, both of England, assignors to Tectron (Eng) Ltd., Surrey, England

Filed Aug. 9, 1983, Ser. No. 521,630

Claims priority, application United Kingdom, Aug. 10, 1982, 8223010

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614.06 **13 Claims**



1. A fluid injector comprising

a housing structure having inlet and outlet ports;

a pair of fluid connections and means defining passageways for fluid between the ports and respective ones of the fluid connections; and

valve means for controlling the flow of fluid along said passageways;

a body assembly including an elongate tubular portion having provision for receiving a nozzle at its outer end;

a pair of fluid connections and means defining passageways for fluid between each of the fluid connections and said outer end of the tubular portion;

said housing structure providing a support for the body assembly and including fluid pressure means for displacing

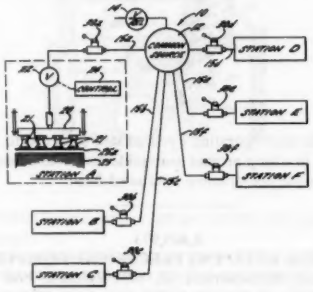
the assembly relative to the housing between a first position, in which the fluid connections on the body assembly are coupled to respective fluid conections on the housing structure, and a second position, in which the fluid connections on the body assembly are disconnected from the fluid connections on the housing structure, and mechanical interlock means arranged to allow said valve means to be operable to permit the flow of fluid along the passageways when the body assembly is in the first position, but not operable when the body assembly is in the second position, and for preventing the body assembly from being moved from the first to the second position when said valve means permit the flow of fluid along the passageways.

4,495,968

PNEUMATIC CONTROL SYSTEM

William J. Kist, Barrington, Ill., assignor to Combined Fluid Products Company, Highland Park, Ill.

Filed Jul. 16, 1982, Ser. No. 398,983
Int. Cl.³ F16K *11/10*
U.S. Cl. 137—624.2 **10 Claims**



1. A pneumatic control system comprising a common pneumatic source of sufficient capacity to maintain a determined air flow at a predetermined minimum pressure level during the operating sequence of the system,

a plurality of intermittently operated pneumatic use points each adapted to draw upon the capacity of said common pneumatic source during their operation,

means connecting each said use point to said common source,

non-pressure responsive selectively adjustable throttling valve means interposed in each said connecting means for establishing and maintaining a predetermined relatively constant pressure at said use point during the operating sequence of said system, said throttling valve means being set to establish different pressures at at least some of said use points, and

means for controlling the operating sequence and rate of operation of said use points such that the draw upon the capacity of said common source by said use points remains substantially constant throughout their operation.

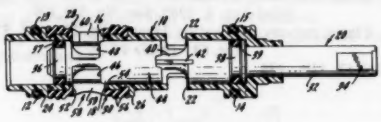
4,495,969

MIXING VALVE WITH WATER MODULATION SEALING MEANS

John D. Givler, Avon Lake, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Continuation of Ser. No. 323,925, Nov. 23, 1981,. This application Sep. 28, 1983, Ser. No. 536,229
Int. Cl.³ F16K *11/02*
U.S. Cl. 137—625.17 **13 Claims**

1. In a mixing valve having a stationary member and a movable member with relative movement therebetween controlling the volume and temperature of water passing therethrough, a hot water inlet port and a cold water inlet port in said stationary member, seal members positioned in said inlet ports and each having an opening therein which controls the



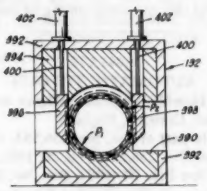
flow of water therethrough, one of said port seal openings having a cross sectional area less than that of said other port seal opening, said one port seal further having a restricted passage, gradually increasing in size toward said opening, controlling the access of water to said seal opening.

4,495,970

LARGE DIAMETER PLASTIC PIPE

Harold T. Pate, Solon, Ohio; William R. Laney, Tecumseh, and Donald H. Shell, Bethany, both of Okla., assignors to Thyssen-Bornemisza Inc., New York, N.Y.

Filed Apr. 18, 1983, Ser. No. 485,865
Int. Cl.³ F16L *9/18*
U.S. Cl. 138—148 **10 Claims**



1. A synthetic resin pipe comprising:

a first synthetic resin pipe section, having both internal and external surfaces in the shape of a semi-cylinder;

a second synthetic resin pipe section having a configuration identical to said first pipe section;

a flange projecting radially outwardly from the longitudinal edges of each of said sections, said first and second sections being fused together along said flanges to form a cylindrical pipe;

a first synthetic resin external pipe element having a corrugated body which includes alternating peaks and troughs formed transversely to the longitudinal axis of said element, said element having a transverse cross section which forms a slightly less than 180° arc;

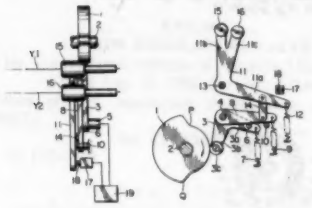
a second synthetic resin external pipe element having a configuration identical to said first synthetic resin external pipe element, said first and second external pipe elements being fitted over said pipe sections and having the peaks on their radially inner surfaces in contact with the radially outer surface of the pipe sections along the length of each peak, each of the longitudinal edges of said elements being fused to one of said flanges.

4,495,971

WEFT INSERTING DEVICE FOR A JET LOOM

Hajime Suzuki, Anjo, and Masao Shiraki, Toyoda, both of Japan, assignors to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki, Kariya, Japan

Filed Aug. 8, 1983, Ser. No. 521,109
Claims priority, application Japan, Aug. 27, 1982, 57-149738
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **4 Claims**



1. A weft inserting device for a jet loom, comprising:

a main nozzle supporting member carrying a plurality of juxtaposed main nozzles adapted for inserting weft yarns supplied from a plurality of weft yarn suppy means, said supporting member being movably mounted in the neighborhood of the weft inserting position for selectively setting the main nozzles at the weft inserting position;

a driving member operatively linked with movable parts of the loom and thereby driven continually and reciprocably;

electrically actuated means for operatively releasably connecting said driving member and said main nozzle supporting member;

means for holding a predetermined one of said main nozzles in the weft inserting position when said one of said main nozzles is placed in such position; and

means for controlling the connecting timing of said connecting means and the operating timing of said holding means.

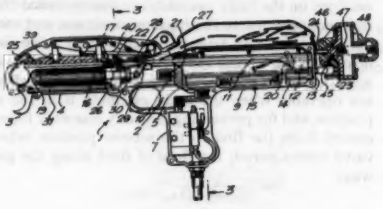
4,495,972

AUTOMATIC TIE GUN

John G. Walker, Hamble, England, assignor to Bowthorpe-Hellermann Limited, Crawley, England

Continuation-in-part of Ser. No. 236,583, Feb. 20, 1981, abandoned, and Ser. No. 236,584, Feb. 20, 1981, abandoned. This application Feb. 24, 1982, Ser. No. 351,997
Claims priority, application United Kingdom, Feb. 27, 1980, 8006529; Feb. 26, 1981, 8106130; Sep. 22, 1981, 8128479
Int. Cl.³ B21F *9/02*
U.S. Cl. 140—93.2 **14 Claims**

1. A tool for automatically applying a flexible tie having a tail and an apertured head around an elongate roll or bundle, said tool being provided with a supply of said ties wherein the supply of ties is in the form of a belt with integral bridging pieces interconnecting the tail portions of adjacent ties, comprising a push rod, driving means for causing said push rod to perform an operating cycle consisting of a forward stroke and a rearward stroke, indexing means driven by said push rod during said rearward stroke of said operating cycle causing a tie to be stepped laterally into a tail forward position in front of the retracting push rod with the apertured head turned into an orientation in which said apertured head is ready to receive said tie tail, said indexing means including a rotary drum rotatable about an axis parallel to the axis of longitudinal movement of said push rod, said rotary drum having a plurality of longitudinal grooves axially extending along its periphery for receiving ties which are to be successively advanced by stepped rotation of said drum into said tail forward position in front of said push rod, said rotary drum further including at least one cicumferential groove peripherally interconnecting said longitudinal grooves, said circumferential groove being positioned to receive the integral bridging pieces in said belt supply of ties, and guide means at the forward end of the tool whereby, said push rod drives said tie forwardly during said forward



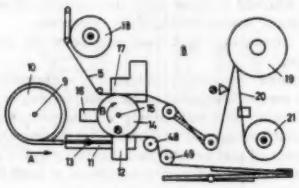
stroke of the next operating cycle of said push rod to advance said tie tail in a loop around said guide means to cause said tie tail to cnter the pre-oriented apertured head.

4,495,973

DEVICE FOR RETAPING ELECTRICAL COMPONENTS

Georg Sillner, Buchenstrasse 23, 8411 Zeitlarn, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,469
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 8135962[U]
Int. Cl.³ B21F *1/00*
U.S. Cl. 140—102 **22 Claims**



1. Apparatus for retaping axially taped electrical components having pigtails into quasi-radially taped components, which comprises a machine frame, a first work station arranged fixed in space on said machine frame, means for stepwise feeding said axially taped components to said first work station, bending menas at said first work station for bending at least one pigtail of said axially taped components, transport means for stepwise transport of bent components away from said first work station, said bending means including a bending mandrel having an axis which lies approximately parallel to an axis in space that extends transverse to the direction of movement of said transport means, a carrier at the first work station swingably mounted about an axis extending in the direction of said axis in space, said carrier bearing, on a side facing the transport means, a protruding bending element which is staggered from the bending mandrel and which forms a mating

surface for the bending mandrel, inserter means at said first work station for inserting a bent component into said transport means, said inserter means including a component resting surface, said resting surface facing said transport means with one end of said bending mandrel protruding beyond said resting surface, said inserter means being displaceable in the direction of said axis in space from a rest position lying remote from said transport means to a work position lying adjacent to said transport means, and cutting means at said first work station for cutting said axially taped components from said taping.

4,495,974

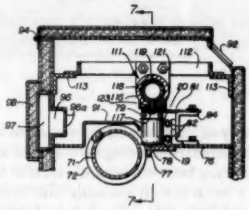
HOT AIR ASEPTIC PACKAGING SYSTEM AND METHOD

Daniel W. Pohorski, San Jose, Calif., assignor to James Dole Corporation, Redwood City, Calif.

Division of Ser. No. 236,766, Feb. 23, 1981, abandoned. This application May 13, 1983, Ser. No. 494,276

Int. Cl.³ B65B *43/42*

U.S. Cl. 141—132 **8 Claims**



1. A filler for use with a hot air aseptic packaging system comprising,

a tunnel, a straight-line conveyor in said tunnel receiving sterile, empty containers at a first end and discharging said containers filled with sterile product at a second end, a filler in said tunnel positioned above said conveyor, first means for delivering said sterile product to said filler, second means for delivering sterile air under pressure to said tunnel,

support means supporting said filler from said tunnel, said filler comprising a casing extending longitudinally above the path of said containers as they are moved along said conveyor, said casing being formed at its bottom with an elongated longitudinal first slit,

a tube of lesser diameter than the interior of said casing disposed within said casing perforated at its top and connected to said first means, said tube being separated from said casing by a space, an elongated insert formed with a second slit disposed in said first slit, and detachable means securing said insert to said casing, whereby said insert may be replaced with another insert having a second slit of different width, product received by said tube flowing into said space between said tube and said casing, thence out through said second slit and into said containers.

4,495,975

SAMPLE TREATMENT DEVICE

Karl U. Harström, Lennaholm; Bengt-Ake Nilsson, Upsala, both of Sweden, and Richard J. Wheeler, Warren, N.J., assignors to Pharmacia AB, Upsala, Sweden

Filed Sep. 21, 1982, Ser. No. 420,911

Claims priority, application Sweden, Sep. 22, 1981, 8105590

Int. Cl.³ B67D *5/00*

U.S. Cl. 141—157 **7 Claims**

1. A sample treatment device comprising:

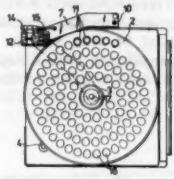
(a) a plurality of test containers,

(b) a treatment unit,

(c) drive means for creating a relative motion between said test containers and said treatment unit so that the test containers are in turn subjected to one or more treatment steps by said treatment unit,

(d) sensor means arranged for relative motion between said test container and said sensor means and arranged to trigger said one or more treatment steps when said sensor means contacts a given area on a test container,

(e) spring means biasing said sensor means against the test containers, and



(f) a guide plate carrying said sensor means and extending essentially in the direction of relative motion between the test containers and the sensor means, said sensor means being arranged to stop, at least for certain test containers, the relative motion between a test container and the treatment unit upon contact with said given area on the test container, and said test containers are carried by a rotatable cassette and are arranged along a helical path thereon.

4,495,976

COMBINATION RADIAL TIRE FOR HEAVY LOAD VEHICLES

Shigeo Makino, Tokorozawa, and Noboru Sugimura, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 216,716, Dec. 15, 1980, abandoned. This application Mar. 24, 1983, Ser. No. 478,802

Claims priority, application Japan, Dec. 25, 1979, 54-167631

Int. Cl.³ B60C *9/08, 15/06*

U.S. Cl. 152—354 R **7 Claims**

1. A combination radial tire for heavy load vehicles comprising; a carcass composed of at least two plies including polyester fiber cords arranged in a plane containing a rotational axis of the tire or inclined at an extremely small angle with respect to said plane, all plies of said carcass being wound around a bead core from the inside toward the outside thereof to form a turn-up portion, a rubber stock disposed on the bead core and interposed between the carcass itself and the turn-up portion thereof, and at least one bead portion reinforcing layer arranged along the turn-up portion of the carcass and including cords crossed with the cords of the turn-up portion of the carcass, at least one additional reinforcing layer arranged at the lower half region of the carcass itself along said rubber stock wherein a lower end of said at least one additional reinforcing layer is fixed to said bead core, said additional reinforcing layer interposed at least between said plies of the carcass itself and-/or between said carcass itself and said rubber stock, said

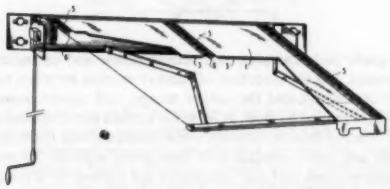
additional layer including aromatic polyamide textile cords which are substantially in parallel with said carcass ply cords, and said additional reinforcing layer extending along said carcass itself over a region having a vertical height measured from the bead base and corresponding to 15% to 45% of a tire height measured from the same bead base.

4,495,977

WIND-UP THERMAL INSULATING AWNING

René E. Delluc, 2, Square du Berry, 91300 Massy, France

Filed Jul. 14, 1982, Ser. No. 398,147
Claims priority, application France, Sep. 21, 1981, 81 17760
Int. Cl.³ E04F *10/06*
U.S. Cl. 160—70 **5 Claims**



1. A thermally insulating exterior awning adapted to be wound up into an elongate roll, comprising:

(a) a sheet of canvas (1) having one edge adapted to be secured to a winding roll,

(b) a plurality of elongate, flexible spacer bead strips (5, 6) attached to the canvas sheet perpendicular to said one edge and spaced apart from each other, and

(c) a thermally insulating foam plastic sheet (3) attached to an underside of the canvas sheet between adjacent spacer bead strips,

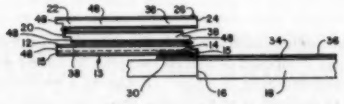
(d) wherein the height of the spacer bead strips is greater than the thickness of the foam plastic sheet to thereby maintain a sufficient spacing between adjacent layers of the canvas sheet upon wind-up to prevent the destructive compression of the foam plastic sheet.

4,495,978

INSULATING SHUTTER PANELS FOR BUILDING OPENINGS

Frank E. Carroll, 237 Maple Rd., Barrington, Ill. 60010

Filed Dec. 10, 1981, Ser. No. 329,196
Int. Cl.³ E06B *3/48, 3/26*
U.S. Cl. 160—117 **29 Claims**



18. Apparatus for insulating a window or other opening in a building comprising:

a plurality of horizontal rail means secured to the interior of said building adjacent to and extending only outwardly from at least one generally vertical edge of said opening;

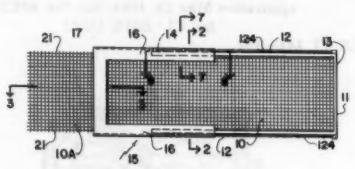
at least one insulated shutter panel slidably engaged with said rail means, said rail means extending horizontally a distance substantially less than the width of said slidably engaged shutter panel to provide concealment of said rail means when said slidably engaged shutter panel is in extreme slidable position in each direction and capable of substantially exposing or substantially covering said opening due to the sliding action of said slidable shutter panel relative to said vertical edge.

4,495,979

ADJUSTABLE WINDOW GRILL

Robert J. Schwob, 28 Thurlow Rd., Hampstead, London, England NW3 5PP

Filed Jan. 13, 1984, Ser. No. 570,641
Int. Cl.³ F06B *3/12*
U.S. Cl. 160—226 **3 Claims**



1. A longitudinally adjustable grill for a window comprising a first rigid frame member including two spaced and parallel arms and base extending between adjacent ends of said arms at one end thereof, a mesh screen spanning said first frame between the arms and base thereof and extending a predetermined amount beyond the open end of said first frame, means for fixing the edges of the screen to the arms and to the base to prevent movement relative thereto, a second frame member comprising a base and two arms, each of the arms comprising a hollow cross section for receiving telescopically slidably therein the arms of the first frame member to complete a variable length of rectangular frame, the cross section being closed except for a slot in the inner surface thereof through which the screen passes, the first frame member having a compressible plush fabric on the outer surface of the arms thereof to engage the respective arm of said second frame member to provide a resistance fit therewith and to extend outwardly from the outer surface of the arm a distance substantially equal to the thickness of the outer surface of the hollow cross section of the second arm.

4,495,980

BINDERS FOR FOUNDRY CORES AND MOULDS

John G. Morley, Kings Coughton, England, assignor to BCIRA, Birmingham, England

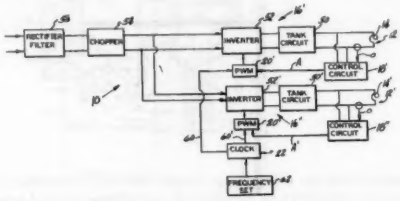
Filed Oct. 7, 1982, Ser. No. 433,231
Claims priority, application United Kingdom, Oct. 10, 1981, 8130649; Apr. 28, 1982, 8212339
Int. Cl.³ B22C *9/12*
U.S. Cl. 164—16 **11 Claims**

1. A method of forming a foundry mould or core comprising adding to a body of granular refractory particles a binder consisting essentially of an alkali metal salt of a polyvalent organic acid or of a polymerised monovalent organic acid, together with an alkaline earth metal hydroxide and water, said acid having a pKa of not less than 2.5 and the total weight of the non-organic constituent of the binder comprising between 25 and 400% of the weight of said alkali metal salt, and then passing an acid gas through the resulting body.

4,495,981
PROCESS AND APPARATUS FOR SYNCHRONIZED ELECTROMAGNETIC CASTING OF MULTIPLE STRANDS

Peter J. Kindlmann, Guilford; John C. Yarwood, Madison; Gary L. Ungarean, Woodbridge, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 2, 1981, Ser. No. 317,373
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—452 **8 Claims**



1. A multi-strand apparatus for casting molten material into ingots of desired shape, comprising:

a plurality of means for receiving and electromagnetically forming said molten material into ingots of said desired shape, each of said receiving and forming means including:

an inductor for applying a magnetic force field to the molten material, said inductor in operation being spaced from said molten material by a gap extending from the surface of the molten material to the opposing surface of the inductor;

means associated with each said inductor for sensing variations in its corresponding gap;

means for applying an alternating current to each said inductor to generate the magnetic force field associated with each inductor;

means for controlling the application of alternating current to each said inductor in response to the gap variation sensing means whereby variations in the gap of each said inductor are minimized;

said current applying means includes a plurality of inverters, each of said inverters connected with one of the inductors for applying current thereto; and

clock means connected with said current applying means for simultaneously directing a turn-on signal to turn on all of said inverters at substantially the same time so as to synchronize the operating frequency of the inductors and substantially eliminate the development of beat frequencies.

6. A process for casting molten material into ingots of desired shape, comprising the following steps:

receiving and electromagnetically forming molten material into a plurality of ingots of desired shape, said step of receiving and forming including the steps of:

providing a plurality of inductors for applying magnetic force fields to the molten material, each of said inductors in operation being spaced from said molten material by a gap extending from the surface of the molten material to the opposing surface of the inductor;

sensing variations in each of the gaps;

applying an alternating current to each of said plurality of inductors to generate the magnetic force field associated with each inductor;

providing a plurality of inverters connected with said plurality of inductors, each of said inverters being connected with one of said plurality of inductors for applying said alternating current thereto;

controlling the application of alternating current to each of said plurality of inductors in response to the sensed variations of their corresponding gaps whereby variations in the gaps are minimized;

providing a clock connected to each of said inverters;

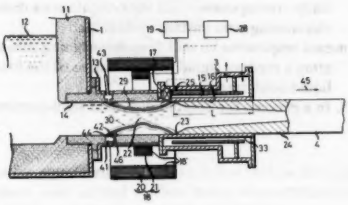
simultaneously applying a turn-on signal with said clock to turn-on all of said inverters at substantially the same time; and

applying a turn-off signal simultaneously to each of said inverters so in order to synchronize the operating frequency of the inductors and substantially eliminate the development of beat frequencies.

4,495,982
HORIZONTAL CONTINUOUS CASTING METHOD

Hideo Kaneko; Hatuyoshi Kumashiro, and Akira Iwata, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 15, 1982, Ser. No. 441,704
Claims priority, application Japan, Nov. 18, 1981, 56-185880; Nov. 18, 1981, 56-185881; Nov. 18, 1981, 56-185882
Int. Cl.³ B22D *11/10, 11/16*
U.S. Cl. 164—452 **11 Claims**



1. A horizontal continuous casting method wherein electromagnetic field generating means is arranged in the vicinity of the boundary between a tundish nozzle and a mold, in order to apply an electromagnetic force to a molten metal flowing through the vicinity of the boundary to constrict the molten metal in the vicinity of the boundary, to thereby cause the molten metal to separate itself from the inner surface of the tundish nozzle anterior to the boundary and bring it into contact with the inner surface of the mold posterior to the boundary, said method comprising:

(a) sensing an actual point at which the molten metal begins to come into contact with the inner surface of said mold with respect to the flowing direction of the molten metal;

(b) comparing said actual point with a set point at which the molten metal is designed to begin to come into contact with the inner surface of said mold; and

(c) applying a control signal corresponding to the difference of said actual point and said set point to said electromagnetic field generating means, to thereby control said electromagnetic field generating means to bring the point at which the molten metal begins to come into contact with the inner surface of the mold into coincidence with said set point.

4,495,983
DETERMINATION OF LIQUID-SOLID INTERFACE AND HEAD IN ELECTROMAGNETIC CASTING

Peter J. Kindlmann, Northford; Gary L. Ungarean, Woodbridge; John C. Yarwood, Madison, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 137,645, Apr. 7, 1980, abandoned. This application Feb. 10, 1983, Ser. No. 465,239
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—452 **10 Claims**

1. In an electromagnetic casting system for casting material comprising:

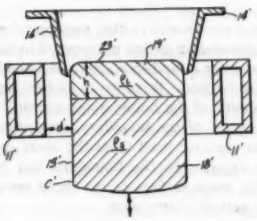
means for electromagnetically containing molten material and for forming said molten material during a casting run into a casting of desired shape, said casting including during said casting run a liquid-solid interface defining

molten material head and solid material portions of said casting, said electromagnetic containing and forming means including an inductor for applying a magnetic field to said molten material, said magnetic field defining a containment zone for said molten material and a gap between said molten material and said inductor, means for applying an alternating current to said inductor to generate said magnetic field, means for controlling the current applied to said inductor whereby said gap remains substantially constant, a non-magnetic shield for attenuating and shaping said magnetic field, the improvement comprising:

means for monitoring the location of said liquid-solid interface, said liquid-solid interface monitoring means including first means for determining at least a first electrical parameter of said electromagnetic casting system which varies with variations in the location of the liquid-solid interface, wherein said first electrical parameter substantially corresponds to the equivalent series resistance of the electromagnetic casting system; and

means responsive to said first determining means for generating a readout signal representative of the location of said liquid-solid interface.

8. In a process for continuously and semi-continuously elec-



tromagnetically containing and forming molten material during a casting run into a casting of desired shape, said casting having during said casting run a liquid-solid interface defining a head of molten material and a solid material portion of said casting, said electromagnetic containing and forming including the steps of: providing an inductor, applying a current in and a voltage across said inductor to generate and apply a magnetic field to said molten material; and applying said magnetic field to said molten material to define a containment zone of said molten material and a gap between said molten material and said inductor; controlling the current to the inductor so that the gap remains substantially constant; providing a non-magnetic shield for attenuating and shaping said magnetic field; the improvement comprising the steps of:

monitoring the location of the liquid-solid interface by determining at least a first electrical parameter of the electromagnetic casting system during said run, said at least first electrical parameter varying with variations in the location of the liquid-solid interface, wherein said first electrical parameter substantially corresponds to the equivalent series resistance of the electromagnetic casting system; and

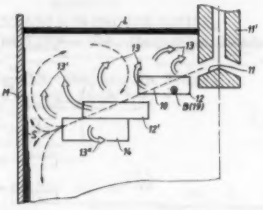
responsive to said step of determining, generating a readout signal representative of the magnitude of the liquid-solid interface.

4,495,984

CONTINUOUS CASTING MOLD STIRRING

Sten Kollberg, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 264,709, May 18, 1981, abandoned. This application Aug. 30, 1983, Ser. No. 527,508
Claims priority, application Sweden, May 19, 1980, 8003695
Int. Cl.³ B22D *11/10, 27/02*
U.S. Cl. 164—468 **2 Claims**



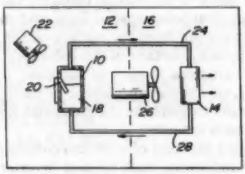
1. A continuous casting mold stirring method for a continuous casting mold of slab cross section having wide side walls and narrow edge walls and containing a body of molten metal maintained by molten metal poured from above the mold through a pipe having a lower end provided with outlets pointing angularly downwardly towards the mold's narrow edge walls and immersed in the upper portion of said body of molten metal so as to inject therein molten metal streams traveling towards the mold's narrow edge walls; wherein the improvement comprises for each of said streams projecting at least one stationary static magnetic field of constant direction through the mold's wide side walls from their outside and into said body and transversely through the stream so as to abruptly reduce the stream's velocity and momentum when in said field with an effect similar to that of an eddy current brake and cause the stream's portion traveling towards said field to push against the stream's portion in said field and split or break up into smaller streams which stir into said body.

4,495,985

DISASSOCIATIVE/REASSOCIATIVE CHEMICAL HEAT PUMP

Stephen Feldman, 110 Lombard St., Philadelphia, Pa. 19147

Filed Aug. 8, 1983, Ser. No. 520,936
Int. Cl.³ F28D *21/00, 15/00*
U.S. Cl. 165—1 **20 Claims**



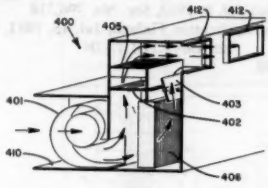
16. A method for transferring heat energy between two different temperatures comprising disassociating a chemical with a spontaneous and complete change of phase, transferring heat from the disassociated chemical to a heat sink, reassociating the disassociating chemical and transferring heat to the reassociated chemical from a heat source.

4,495,986

METHOD OF OPERATING A VARIABLE VOLUME MULTIZONE AIR CONDITIONING UNIT

William E. Clark, Syracuse, and Donald C. Wellman, Marcellus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,606
Int. Cl.³ F24F 3/044
U.S. Cl. 165—2 6 Claims



1. A method of simultaneously supplying a variable volume of warm, cool or neutral air, as required, to a plurality of zones including the steps of:

supplying neutral air from a variable supply means through an air cooling means only to all zones requiring cool air;

regulating the amount of cooled neutral air supplied by the variable supply means to each zone requiring cool air;

supplying neutral air from the variable supply means to all zones requiring warm or neutral air;

regulating the amount of neutral air supplied by the variable supply means to each zone requiring warm or neutral air; and

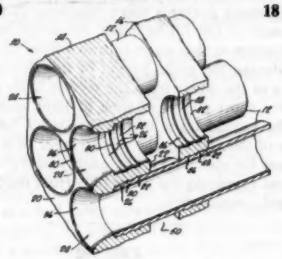
heating the neutral air supplied to those zones requiring warm air.

4,495,987

TUBE AND TUBE SHEET ASSEMBLY

Marshall N. Finnan, Santa Ana, Calif., assignor to Occidental Research Corporation, Los Angeles, Calif.

Filed Feb. 18, 1983, Ser. No. 467,726
Int. Cl.³ F28F 9/16
U.S. Cl. 165—70 18 Claims



1. A tube and tube sheet assembly for a heat exchange device comprising:

a plurality of heat exchanger tubes; and

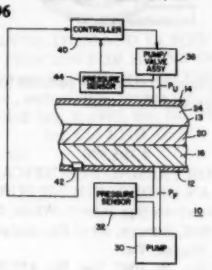
a tube sheet having a front and a back face and means defining a plurality of generally circular holes therein, each hole corresponding to one of the heat exchanger tubes and communicating with a reamed portion of the tube sheet back face, said reamed portion being sized for insertion of the corresponding heat exchanger tube and communicating with at least one groove in a wall of the reamed portion to enable a portion of the corresponding tube to flow thereinto upon explosive forming of the tube after insertion of the tube into the reamed portion, the hole diameter being of the same diameter as the tube inside diameter after explosive forming to provide a smooth, continuous transition therebetween, said tube sheet front face having means defining an opening communicating with each of said holes, each said opening having a convex surface defined by the surface of revolution of an arc extending outwardly from the circumference of each hole said last mentioned means further defining a smooth continuous curved surface interconnecting adjacent holes.

4,495,988

CONTROLLED HEAT EXCHANGER SYSTEM

Arthur Grossman, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 9, 1982, Ser. No. 366,931
Int. Cl.³ F28F 27/00
U.S. Cl. 165—96 1 Claim



1. A system for transferring heat from a first surface through a second surface, said second surface being characterized by substantially uniform thermal envelope, comprising:

an inner porous layer adjacent to said first surface, said inner layer being characterized by relatively high porosity and thermal conductivity, and being adapted to house coolant,

an outer porous layer between said inner layer and said second surface, said outer layer being characterized by a relatively low porosity and relatively high thermal conductivity, wherein said outer layer is thermally coupled to said inner layer and the pores of said outer layer are coupled to the pores of said inner layer permitting coolant flow therebetween, wherein the pores of one of said porous layers are filled with a material whereby coolant flow is prevented between inner and outer pores, said material characterized by a predetermined melting point whereby said material melts and said coolant flow is permitted when said first surface reaches a predetermined temperature,

a vapor chamber between said second surface and an outer member,

means for selectively controlling the vapor pressure in said vapor chamber whereby said coolant has a liquid vapor phase transition within said outer layer.

4,495,989

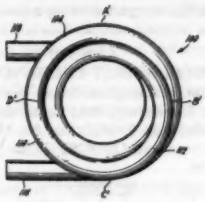
MULTIPLE COIL HEAT EXCHANGER

Richard W. Sievers, South Windsor, Conn., assignor to Spiral Tubing Corporation, Windsor, Conn.

Continuation of Ser. No. 141,894, Apr. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 83,568, Oct. 11, 1979, abandoned. This application Mar. 15, 1984, Ser. No. 589,846
Int. Cl.³ F28D 7/02
U.S. Cl. 165—172 16 Claims

1. A heat exchanger comprising a multiple coil structure having a common axis and formed from a continuous tube having inlet and outlet ends, said structure including an inner coil formed of said tube beginning from said inlet end and having a plurality of abutting and substantially identical turns coiled about and spaced along said common axis to the other end of said structure, an outer coil formed of said tube and having a plurality of abutting and substantially identical turns coiled concentrically and substantially coextensive with said inner coil and spaced along said common axis toward said inlet end, and a continuous transition segment joining said inner and said outer coils at said other end of said structure and having a

first curved portion substantially parallel to said inner coil radially extending said tube relative to said inner coil and a



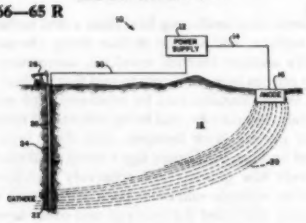
second curved portion substantially parallel to said outer coil which extends over said inner coil.

4,495,990

APPARATUS FOR PASSING ELECTRICAL CURRENT THROUGH AN UNDERGROUND FORMATION

Charles H. Titus, Newtown Sq.; John K. Wittle, Chester Springs, and Christy W. Bell, Berwyn, all of Pa., assignors to Electro-Petroleum, Inc., Wayne, Pa.

Filed Sep. 29, 1982, Ser. No. 427,708
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—65 R **13 Claims**



2. An apparatus for passing electrical current from a D.C. power source having first and second terminals through an underground formation in the extraction of carbonaceous fluids from beneath the earth's surface, the apparatus comprising an anode and a cathode remote from the anode, the anode comprising:

a containment positioned proximate to the underground formation;

a first layer of generally wet conduction material suitable for ion conduction positioned in the containment to enhance conduction between the anode and the underground formation, the containment permitting conduction between the first layer of conduction material and the underground formation;

conductor means connected with the first terminal of the power source for providing a flow of electrical current for the anode; and

a second layer of generally dry condition material positioned in the containment in contact with the first layer of conduction material and generally surrounding the conductor means to isolate the conductor means to prevent deterioration of the conductor means by electrolysis; the cathode comprising:

a screen housing comprised of an electrically conductive material, the screen housing positioned within a well bore proximate to the underground formation;

means for supporting the screen housing at a predetermined position within the well bore; and

second means connecting the screen housing to the second terminal of the power source for conducting current from the screen housing to the power source,

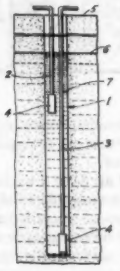
whereby electrical current from the power source is passed through the conductor means, the anode, the underground formation, the cathode, and the second means and back to the power source.

4,495,991

PROCEDURE FOR DRAWING WATER FROM A GROUND WATER STORE

Veli Reijonen, Takametsäntie 11, 00620 Helsinki 62, Finland

Filed Jul. 8, 1982, Ser. No. 396,318
Claims priority, application Finland, Jul. 15, 1981, 812220
Int. Cl.³ E21B *47/04*
U.S. Cl. 166—250 **4 Claims**



1. Procedure for drawing water from a ground water store wherein the ground water store has a considerable vertical height containing water layers of different quality relative to the water quality suitable for consumption with a first layer having an impurity content so that the water is suitable for consumption and a second layer having a higher impurities content which renders the water less suitable for consumption, determining the location of the first and second layers, installing at least two separate lifting pipes into the ground water store so that the inlet to each lifting pipe is located in a different one of the first and second layers, selectively drawing water during a given relatively short period of time from each of the lifting pipes extending into the first and second layers so that water is drawn from the first and second layers during the given period of time, drawing a sufficient quantity of the water from the second layer during the given relatively short period of time to limit movement of water from the second layer to the first layer for preventing the mixture of the water in the second layer with the water in the first layer for maintaining the quality of the water in the first layer, and supplying the water only from the first layer for use in normal consumption.

4,495,992

HYDRAULIC LOGGING TECHNIQUE FOR INVERTED OIL WELLS

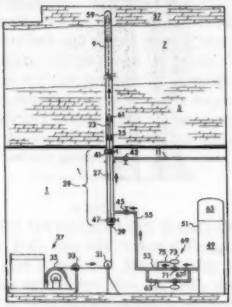
John S. Hutchins, Littleton, and Mervyn A. DeFours, Golden, both of Colo., assignors to Tetra Systems, Inc., Golden, Colo.

Filed Jul. 6, 1983, Ser. No. 511,541
Int. Cl.³ E21B *47/00*
U.S. Cl. 166—250 **20 Claims**

1. A method for raising and lowering a tool such as a logging tool within a well hole extending upwardly from a mining drift, said well hole being separated from said drift by sealing means to prevent the passage of fluid therebetween, said tool having a flexible cable attached thereto and passable through a substantially fluid-tight seal in said sealing means, said tool further having means for engaging said well hole in a substantially fluid-tight, sealing engagement, said method including the steps of:

(a) positioning said tool within said well hole in said fluid-tight, sealing engagement with said well hole with said flexible cable attached thereto passing through said fluid-tight seal in said sealing means,

(b) supplying fluid under a first pressure to said well hole below said sealing engagement of said tool therewith, said first pressure being sufficient to overcome any fluid head within said well hole on said tool and to raise said tool and attached cable upwardly within said well bore,



(c) halting the upward travel of said tool and attached cable within said well hole,

(d) drawing the cable and attached tool downwardly to create a second pressure in the fluid within said well hole below said sealing engagement of said tool therewith,

(e) continuing to draw said cable and attached tool downwardly, and

(f) maintaining the pressure in the fluid within said well hole below said sealing engagement of said tool therewith substantially constant at said second pressure during step (e).

11. An arrangement for raising and lowering a tool such as a logging tool within a well hole extending upwardly from a mining drift, said arrangement including:

said tool, a flexible cable, and means for attaching said cable to said tool,

means for forming a substantially fluid-tight, sealing engagement between said tool and said well hole,

means for sealing said well hole from said drift to prevent passage of fluid therebetween, said sealing means including a substantially fluid-tight seal for passing said flexible cable therethrough,

means for positioning said tool within said well hole in said fluid-tight, sealing engagement with said well hole with said flexible cable attached thereto passing through said fluid-tight seal in said sealing means,

means for supplying fluid under a first pressure to said well hole below said sealing engagement of said tool therewith, said first pressure being sufficient to overcome any fluid head within said well hole on said tool and to raise said tool and attached cable upwardly within said well bore,

means for drawing the cable and attached tool downwardly to create a second pressure in the fluid within said well hole below said sealing engagement of said tool therewith, and

means for maintaining the pressure in the fluid within said well hole below said sealing engagement of said tool therewith substantially constant at said second pressure as said cable and attached tool are being drawn downwardly.

4,495,993

METHOD FOR IN-SITU RECOVERY OF ENERGY RAW MATERIALS BY THE INTRODUCTION OF CRYOGENIC LIQUID CONTAINING OXYGEN

Leonard M. Andersen, 46 Alexander Ave., Yonkers, N.Y. 10704

Filed Nov. 30, 1981, Ser. No. 325,925

Int. Cl.[3] **E21B** *43/243*

U.S. Cl. 166—261 **9 Claims**

1. A method for recovering energy raw materials such as oil and gas from a subterranean formation penetrated by a borehole, comprising the steps of:

introducing into said borehole a fluid material which will prevent combustion of a cryogenic liquid containing oxygen to be subsequently introduced;

thereafter continuously introducing a cryogenic liquid containing oxygen into said borehole through a suitable pipe so that said cryogenic liquid contacts the adjacent subterranean formation; and

closing the borehole and permitting the oxygen to vaporize, the amount of oxygen and its pressure being sufficient to enable a limited combustion of the available energy raw materials in the borehole.

4,495,994

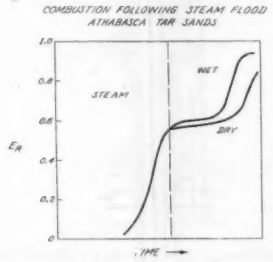
THERMAL INJECTION AND IN SITU COMBUSTION PROCESS FOR HEAVY OILS

Alfred Brown; Wann-Sheng Huang, and Yick-Mow Shum, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 2, 1983, Ser. No. 463,203

Int. Cl.[3] **E21B** *43/243*

U.S. Cl. 166—261 **13 Claims**



1. A method for stimulating the production of hydrocarbons from a subterranean heavy oil or tar sand formation penetrated by an injection well and a production well, which comprises:

(a) stimulating the production well by injecting steam into the production well, shutting in the production well and then producing the well;

(b) injecting about 0.6 to about 1.2 pore volumes of steam having a quality greater than about 75% into the injection well;

(c) after injection of greater than 75% quality steam, injecting about 0.1 to about 0.6 pore volume of steam into the injection well while gradually decreasing the quality of the steam from its initial quality of greater than about 75% to a quality less than about 20%;

(d) after injection of decreasing quality steam, injecting about 0.5 to about 1.5 pore volumes of water into the injection well;

(e) after water injection, injecting air into the formation and creating an in situ combustion front; and

(f) injecting water into the formation along with the air after the combustion front has propagated about thirty to about fifty feet from the point of injection.

4,495,995

METHOD FOR PLUGGING AND SUBSEQUENT TREATMENT OF SUBTERRANEAN FORMATIONS

Hsiu Kuo Chen, Mission Viejo, Calif., and Charles P. Thomas, Littleton, Colo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 19, 1980, Ser. No. 150,832

Int. Cl.[3] **E21B** *33/138, 43/22*

U.S. Cl. 166—273 **6 Claims**

1. A process for temporarily plugging permeable portions of

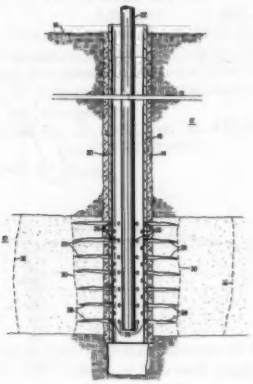
a subterranean formation which comprises driving a composition formed by interacting aqueous surfactant solution and CO_2 in the form of a dense fluid or a liquid into said permeable portions of the underground formation wherein the subterranean formation is at a pressure in a range of about 700 to about 5000 psi and a temperature in a range of about 50° to about 200° F.

4,495,996

METHOD FOR SCALE REMOVAL AND SCALE INHIBITION IN A WELL PENETRATING A SUBTERRANEAN FORMATION

Kevin O. Meyers, Plano, and Harry L. Skillman, Jr., Dallas, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 1, 1983, Ser. No. 556,758
Int. Cl.³ E21B *43/27, 43/28*
U.S. Cl. 166—279 **6 Claims**



1. A method for removing scale and inhibiting the formation of scale in a well penetrating a subterranean formation for the production of fluids from said formation, said method comprising;

(a) injecting an aqueous solution of a mineral acid into said well in an amount and for a a time effective to remove scale from said well;

(b) injecting an aqueous solution of EDTA into said well in an amount and for a time effective to remove scale from said well; and,

(c) injecting a scale inhibitor through said well into said formation about said well.

4,495,997

WELL COMPLETION SYSTEM AND PROCESS

James B. Scott, and Fred J. Radd, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

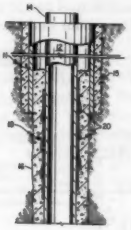
Filed May 11, 1983, Ser. No. 493,559
Int. Cl.³ E21B *33/14*
U.S. Cl. 166—285 **13 Claims**

9. In the completion of a well extending to a subterranean location in the earth's crust, the method comprising:

(a) providing a plurality of casing joints with a wrapping of perforated metal ribbon disposed about the outer surface of said joints in a helically wound conformation;

(b) installing said joints in the well to form a casing string therein and provide an annular space between said casing string and the wall of said well;

(c) flowing a slurry of hydraulic cement into said annular space and allowing said cement slurry to set to form a cement sheath between said casing string and the wall of said well;



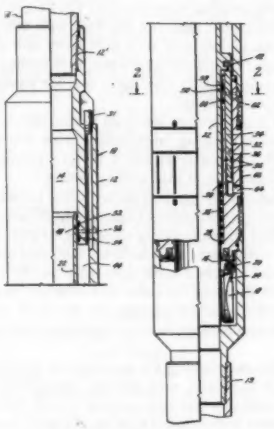
wherein successive helical turns of said ribbon partially overlap one another.

4,495,998

TUBING PRESSURE BALANCED WELL SAFETY VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Mar. 12, 1984, Ser. No. 588,609
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—321 **8 Claims**



1. In a well safety valve for controlling the fluid flow through a well conduit and including a tubular housing and a valve closure member moving between open and closed positions, a longitudinally tubular member telescopically movable in the housing for controlling the movement of the valve closure member, means for biasing the tubular member in a first direction for causing the valve closure member to move to the closed position, a piston and cylinder assembly positioned in the housing, one of which is connected to the tubular member, one side of the assembly adapted to be in communication with hydraulic fluid extending to the well surface for moving the valve closure member to the open position, the improve-

ment in means for preventing pressure in the well conduit from affecting the opening and closing of the valve comprising,

first and second spaced seal means between the tubular member and the housing for preventing fluid pressure in the tubular member from communicating with the piston and cylinder assembly,

the outside diameter of the said tubular member on which the first and second seal means engage being of the same diameter whereby the forces on the tubular member from the pressure in the tubular member is balanced, and

a vent port in communication with the second side of the piston and cylinder assembly for allowing operation of the assembly by hydraulic fluid from the surface acting on said one side of the assembly.

4,495,999

DEEP WATER HYDROSTATIC HEAD CONTROL

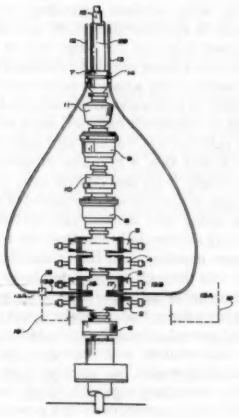
James H. Sykora, P.O. Box 64677, Baton Rouge, La. 70896

Continuation-in-part of Ser. No. 376,409, May 10, 1982, Pat. No. 4,427,073. This application Nov. 21, 1983, Ser. No. 553,772

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.³ E21B *43/01*

U.S. Cl. 166—364 **2 Claims**



1. In a marine riser and BOP stack assembly positioned near the bottom of a water body and having multiple rams, a kill line and a choke line, the improvement to which comprises connecting an eductor to said kill line to receive any kick gas from said assembly through an eductor intake opening wherein said eductor comprises a suction end openable to said water body to allow water to mix with said kick gas in said eductor.

4,496,000

METHOD OF AND APPARATUS FOR SETTING A MECHANICAL LINER HANGER BY RIGHT-HAND ROTATION

Benjamin R. Weeks, Corpus Christi, Tex., assignor to Texas Independent Tools and Unlimited Service, Inc., Corpus Christi, Tex.

Filed Feb. 11, 1983, Ser. No. 465,738

Int. Cl.³ E21B *23/00*

U.S. Cl. 166—382 **6 Claims**

1. A right-hand set mechanical liner hanger for engaging the inside of a well conduit comprising,

a mandrel having an annular wedge cone around the outer circumference of the mandrel,

a lug connected to the outside of the mandrel below the cone,

a cage telescopically and rotationally movable on the mandrel between the cone and said lug,

said cage including,

a plurality of slips extending upwardly adapted to move upwardly onto the cone and outwardly to a set position for engaging a well conduit,

a plurality of bow springs extending outwardly for engaging a well conduit for allowing longitudinal and rotational movement of the cage relative to the mandrel,

said cage including an upwardly directed opening for engagement by the lug whereby the cage can be moved downwardly in a well conduit with the mandrel while preventing the slips from setting,

said cage including a clockwise downwardly extending and downwardly directed spiral surface extending from above the opening to past the bottom of the opening whereby an upward movement of the mandrel will move the lug out of the opening onto the downwardly directed surface and right-hand rotation of the mandrel will move the slips upwardly onto the cone for setting,

the rotational extent of the downwardly directed surface is greater than 360 degrees, and

a vertical passageway in the cage for said lug extending between the upper and lower extents of said downwardly directed surface.

4,496,001

VACUUM SYSTEM FOR REDUCING HEAT LOSS

Harrison W. Sigworth, Jr., Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1982, Ser. No. 431,417

Int. Cl.³ E21B *36/00, 43/24*

U.S. Cl. 166—387 **29 Claims**

1. A method for reducing heat loss from steam injection tubing located in a well casing penetrating through the earth to an oil producing formation for producing oil therefrom comprising the steps of:

(a) sealing the upper portion of said well casing to form an air-tight chamber therein;

(b) extending steam injection tubing from the earth's surface, through the sealed upper portion of said well casing in air-tight relationship therewith and terminating adjacent the lower portion of the well casing suitable for injecting steam into the oil producing formation;

(c) packing off the space between said steam injection tubing and the well casing adjacent the lower portion of the tubing string and above the oil producing formation to form a substantially annular chamber between the upper portion of said well casing and the packed off portion thereof;

(d) maintaining a partial vacuum within said annular cham-

ber said minimum and maximum vacuum within said annular chamber being 25" mercury and 29" mercury, respectively, such that condensation of water vapor cannot occur on the surfaces forming said annular chamber;

(e) filling at least a portion of said annular chamber with loose fill insulating material; and

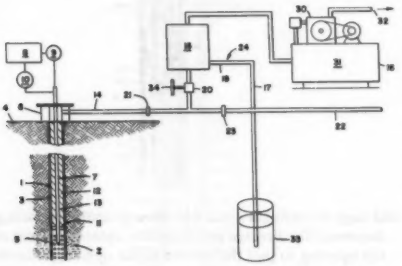
(f) isolating the vacuum producing means so pressure in excess of a predetermined value does not damage any components thereof.

14. A system for reducing heat loss from steam injection tubing located in a well comprising:

(a) a tubular well casing positioned in a well and extending from the earth's surface to an oil producing formation;

(b) a sealing means at the upper portion of said well casing forming an air-tight seal thereon, the lower portion of said casing adapted to allow oil to be produced up said well from said producing formation;

(c) steam injection tubing extending through said sealing means into said well casing and terminating adjacent the lower portion thereof, said tubing string providing a flow path for steam from the earth's surface to the producing formation;



(d) a thermal packer, adjacent the lower portion of the well, and closing off the space between said tubing and said well casing above said producing formation, forming a substantially annular chamber between said sealing means and said thermal packer;

(e) vacuum producing means, including a vacuum pump communicating with a vacuum pump tank, said vacuum pump having a vacuum outlet tube, said vacuum pump tank having a vacuum inlet tube, said inlet connected to the well casing and communicating with the annular chamber to impose a partial vacuum therein to draw vapor from within the annular chamber toward the outlet; and

(f) a means for condensing the vapor drawn by the vacuum prior to the vapor reaching the vacuum producing means, a condensing drain outlet in said condensing means for discharging fluid therethrough, means for producing a second partial vacuum at the outlet having a pressure at most equal to the pressure of the first partial vacuum connected to said outlet.

4,496,002

HORSESHOE

Joseph W. Jones, 6119 Bermuda Dunes Dr., Houston, Tex. 77069, and Edward W. Bishop, Box 47H, Brookshire, Tex. 77423

Filed Jul. 21, 1983, Ser. No. 515,830
Int. Cl.³ A01L *5/00*
U.S. Cl. 168—4 **9 Claims**

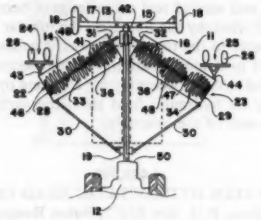
1. A working horseshoe fabricated from an ultra-high molecular weight ethylene polymer having a molecular weight of at least about 1 million.

4,496,003

ROCK GATHERING APPARATUS

Colonel N. Bynum, Box 455, Choteau, Mont. 59422

Filed Jan. 3, 1983, Ser. No. 455,406
Int. Cl.³ A01B *43/00*
U.S. Cl. 171—63 **8 Claims**



1. Rock gathering apparatus including a frame portion, a rock advancing portion, a control portion and a drive portion; said frame portion including a first wheeled carriage section, an elongated hitch member extending from said first wheeled carriage section; said rock advancing portion including a pair of pivotable wing sections extending outwardly from said frame portion in opposite directions, second wheeled carriage means disposed adjacent the outer end of each wing section, said wing sections being normally disposed with the outer ends thereof forward of the adjacent inner ends thereof and pivotable forwardly to positions closely adjacent and parallel to one another and to said hitch member, each of said wing sections including a rake section, each of said rake sections including a central horizontal axle, a plurality of spaced finger members extending radially from said central axle, said finger members being arranged in continuous compounded spiral patterns with the spacing along said central axis between adjacent finger members being substantially less than the rock contacting face of each finger member, said finger members being affixed to said central axis through an extended length arcuate cutout in each finger member adjacent said axis; said control portion including hydraulic cylinder means operatively connected to said first and second wheeled carriages for adjusting the position of said rake sections with respect to the ground; said drive portion including means for rotating said central axles, said drive portion including separable shaft means and universal joints therebetween connectable to a power takeoff, said drive means including an arrangement of gears disposed adjacent the outer ends of said wing sections, said gear arrangements including interchangeable gears for changing the rotational rate of said rake sections; whereby as said rock gathering apparatus is moved over a field said rocks are advanced by said rake sections toward the space between the adjacent inner ends of said wing sections and collected in a continuous windrow.

4,496,004

REARWARDLY FOLDING AGRICULTURAL IMPLEMENT

Roland J. Frase, Roselle, and Leonard A. Bettin, Lyons, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Apr. 30, 1982, Ser. No. 373,752
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **29 Claims**

1. A rearwardly folding agricultural implement comprising:

a. a wheeled cart adapted to be connected to and drawn by a tractor;

b. a pair of toolbars supporting around working elements, with each toolbar being pivotally mounted on said cart generally adjacent the bar inner end for movement between a first lowered field operating position wherein said bars are transversely aligned to the direction of implement travel and said ground working implements are mounted rearwardly of said toolbars in ground engaging relation

and an elevated transverse second position above said first position and then to a third road transit position in which the toolbars are pivoted rearwardly;

c. ground engaging steerable wheel support means mounted on each toolbar generally adjacent the bar outer end and supporting the toolbar in all of said positions;

d. latch means for connecting each toolbar to the cart in the field operating and elevated positions;

e. first hydraulic means for moving each toolbar between said first operating position and said second elevated position;

f. second hydraulic means for actuating each said latch means;

g. third hydraulic means for steering each said wheel support means;

h. control means for operating said first, second and third hydraulic means independently in sequence; and

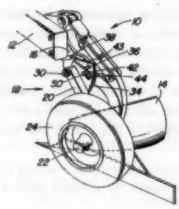
i. a hydraulic circuit for said first, second, and third hydraulic means including a flow divider for providing substantially equal flow to each said third hydraulic means for movement of said toolbars between the elevated second and rearward road transit positions upon movement of the implement.

4,496,005

CONTINUOUS GAUGE WHEEL ARM ADJUSTMENT DEVICE WITH SCISSORS ACTION LOCKING

James A. Swartzendruber, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 13, 1983, Ser. No. 513,534
Int. Cl.³ A01B *15/00*
U.S. Cl. 172—395 **11 Claims**



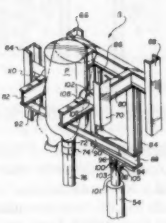
1. In a framed implement, a continuously adjustable gauge wheel arm assembly comprising: a gauge wheel arm having a first end pivotally connected for rocking with respect to the implement frame about a pivotal axis, a first plate member connected for rocking with the arm about the axis, a second plate member fixed with respect to the frame parallel and adjacent the first plate member, said plate members including a plurality of elongated slots extending generally radially outwardly from the pivotal axis, said first and second plate members including first and second slots, respectively, having an area of overlapping, said area of overlapping moving radially with respect to the pivotal axis between the ends of one of said slots as the arm is rocked between first and second positions, and securing means including a shank portion extending through the overlapping area of the slots for preventing the plate members from rocking, wherein the axes of the slots form an acute angle with respect to each other so that the edges of the slots in the overlapping area act generally on opposite sides of the shank in scissors fashion and help to prevent relative rocking between the plate members, a gauge wheel connected to the other end of the gauge wheel arm, and wherein at least one of the plate members includes a plurality of slots, said plurality of slots so arranged to provide continuous areas of overlapping between said plurality of slots and the slot in the other of the plate members as the arm is rocked to any position between said first position and a third position beyond said second position.

4,496,006

CYLINDER DISPLACEABLE POWER SWIVEL FOR A PORTABLE DRILLING APPARATUS AND A PROCESS THEREFOR

Albert W. Smith, 2415 Holley St., Tyler, Tex. 75701

Filed May 4, 1983, Ser. No. 491,531
Int. Cl.³ E21B *7/02*
U.S. Cl. 173—28 **9 Claims**



1. A cylinder displaceable slide gate and power swivel for well drilling rigs and the like, comprising:

(a) a longitudinally extending rig frame having an upper end and a lower end and including a ground supported base connected to said lower end;

(b) a first cooperating pair and a second cooperating pair of guide means secured to said frame and extending substantially between said upper end and said lower end, each of said pairs of guide means includes a pair of guide members;

(c) multi-stage cylinder and piston means secured to said base between a first one of said first and second pair of guide means and generally equidistant the guide members thereof;

(d) a slide gate assembly secured above and to said cylinder and piston means and displaceable therewith substantially between said upper end and said lower end;

(e) a plurality of guide means extend from said slide gate assembly and cooperate with said guide members of said first and second pair of guide means for guiding said slide gate assembly during displacement thereof;

(f) a plurality of spaced generally parallel support members are secured to said frame generally transverse to said guide members and are adapted for preventing bending of said frame during operation of said drilling rig;

(g) a power swivel connected to said slide gate assembly and displaceable therewith and adapted for rotating drill pipe on an axis parallel to and spaced from said cylinder and piston means axis;

(h) said power swivel axis being aligned with and spaced generally equidistant from the guide members of the other pair of said first and second pair of guide means; and,

(i) means for operating said cylinder and piston means and for operating said power swivel.

4,496,007

COMPRESSED-AIR PILE-DRIVER

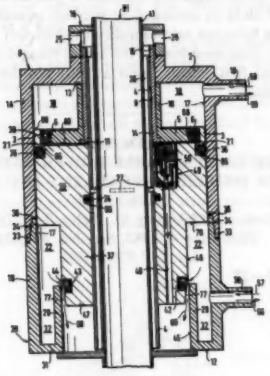
Eugen Zinck, Hüffelsheimer Str. 2, 6550 Bad Kreuznach, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,158

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112463; Sep. 25, 1981, 3138130

Int. Cl.³ B25D 9/00; E21B 1/00

U.S. Cl. 173—127 18 Claims



1. A compressed-air pile-driver, comprising in combination:

a housing;

a ram which divides the interior of said housing into an upper expansion/compression chamber including a pressure chamber and a lower expansion/compression chamber, each of which has its own air-outlet orifice; said ram having a first end face which faces said upper expansion chamber;

a control valve connected to a source of compressed air;

a first air connection pipe connected to and opening exclusively into the pressure chamber of said upper expansion chamber;

a second air connection pipe connected to said lower expansion chamber, said first and second air connection pipes being alternately connectable to said source of compressed air via said control valve, with said air-outlet orifices of said upper and lower expansion chambers being alternately opened by said ram;

an intermediate plate which is approximately parallel to said first end face of said ram and divides off the pressure chamber in said upper expansion chamber remote from said lower expansion chamber, said first air connection pipe communicating with said pressure chamber to effect said connection with said upper expansion chamber; said intermediate plate including at least one axial orifice as an air inlet which extends from said pressure chamber to said upper expansion chamber, said at least one orifice of said intermediate plate being closed in a leak-proof manner by said ram in its upper dead-center position;

a retaining device associated with said ram and said intermediate plate for firmly axially retaining said ram in its upper dead-center position, said ram including an axial extension which, in the upper dead-center position of said ram, is located in said at least one inlet orifice of said intermediate plate to effect closing thereof; and including a sealing ring located in said intermediate plate and resting with radial pressure against said extension so as to seal off air, said extension and said sealing ring at the same time forming said retaining device for said ram, said at least one air-inlet orifice of said intermediate plate being formed by an annular gap located between the radially outer edge of said intermediate plate and said housing; said sealing ring being provided in said outer edge and having a sealing edge projecting radially into said annular air-inlet gap; said axial extension of said ram being designed as an annular extension and being located, in the upper dead-center position of said ram, in said annular air-inlet gap, and a guide tube passing centrally and in a largely air-tight manner through said housing, said intermediate plate, and said ram, said guide tube terminating approximately at the lower end face of said housing, to which it is fastened, the shaft of a tool or of a probe tube being inserted into said guide tube at a radial distance from the wall of the latter; said housing having a head on which is arranged a spacer which has a central bore corresponding to the diameter of said shaft, and which has air-channels through which outgoing air flowing between said guide tube and said shaft escapes into outside air.

4,496,008

WELL PERFORATING APPARATUS

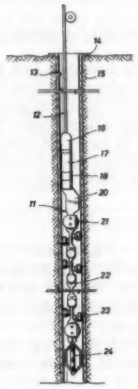
Alain Pottier, Houston, Tex., and Pierre Chesnel, Savigny-sur-Orge, France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 10, 1981, Ser. No. 291,869

Claims priority, application France, Aug. 12, 1980, 80 17723; Feb. 10, 1981, 81 02547

Int. Cl.³ E21B 43/111

U.S. Cl. 175—4.6 10 Claims



1. In a well perforating apparatus including an elongated support, means forming longitudinally spaced attachment holes in the support, explosive charges having sealed cases fixed to the support in the attachment holes wherein each charge case comprises a metallic body member of sufficient strength for attachment to said support and detonating means connected to said charges to fire them, the improvement comprising:

(a) means on said support forming a series of angularly offset flat-faced support portions around and in the longitudinal direction thereof,

(b) means on each of said support portions forming pairs of the longitudinally spaced attachment holes therein with a distance between the centers of each hole within the pair being smaller than the maximum diameter of a charge perpendicular to its axis, each of said attachment holes being configured to support a charge with the axis of the charge substantially perpendicular to said support portion flat faces,

(c) rear parts in the charge cases adapted for engaging said charge cases in said attachment holes such that two charges are fixed on each of said support portions with the axes of said two charges oriented in opposite radial directions, and

(d) a cover member for each of said charge cases made of brittle material for breaking into small size debris after the explosion of the charge, wherein said metallic body is made of extruded steel having a better breaking resistance in the direction of the charge axis than perpendicular to this axis so that the major part of said body opens under the effect of the explosion of the charge while remaining attached by the rear part of the charge to said support after the explosion.

4,496,009

THROUGH THE TUBING PERFORATING GUN ASSEMBLY

Raymond W. DerMott, Brenham, Tex., and Kenneth J. Hartwein, New Orleans, La., assignors to Shell Oil Company, Houston, Tex. and Schlumberger Technology Corp.

Filed Sep. 20, 1983, Ser. No. 534,014
Int. Cl.³ E21B *43/116*
U.S. Cl. 175—4.52 **10 Claims**

1. A through the tubing perforating gun assembly comprising:
- a uniform non-frangible tubular charge carrier;
- an upper head member, said head member being attached to said carrier by frangible means;
- a plurality of focused perforating charges, said charges being disposed on a loading strip, said charges being disposed in said carrier and said loading strip being secured to said head member by a frangible means;
- at least one non-focused charge disposed at the top of said loading strip for opening a hole in the tubular charge carrier member to allow an inrush of well fluids for fracturing both said frangible means and separating said carrier and said loading strip from said upper head member;
- a lower end cap disposed to close the lower end of said carrier; and
- a filler member disposed in the lower end of said carrier to prevent the collapse of the tubular carrier when said tubular carrier separates from said head member.

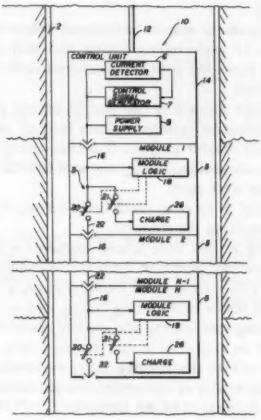
4,496,010

SINGLE-WIRE SELECTIVE PERFORMATION SYSTEM

Joseph E. Chapman, III, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 2, 1982, Ser. No. 394,948
Int. Cl.³ E21B *43/116*
U.S. Cl. 175—4.55 **59 Claims**

1. In a single-line selective perforating system having a single firing line for electrically connecting a firing control unit to each of a plurality of shot modules, one at a time in a predetermined sequence, where each module is adapted for connecting the connected control unit to a next module, a method of selecting a module for firing comprising the step of connecting each module one at a time in the predetermined sequence to the firing line under control of module active time intervals internally generated in the modules, where each module generates



its active time interval in response to being connected to the firing line with the next module in the sequence automatically connected to the firing line at the end of the active time for the last connected module if that module was not selected for firing during its active time interval.

4,496,011

TOOL FOR FORMING EARTH HOLES HAVING FIXED WALLS AND METHOD THEREFOR

Boris M. Mazo, and Valentin I. Feklin, both of Dnepropetrovsk, U.S.S.R., assignors to Dnepropetrovsky Inzhenerno-Stroitelny Institut, Dnepropetrovsk, U.S.S.R.

Filed Jul. 26, 1982, Ser. No. 402,073
Claims priority, application U.S.S.R., Sep. 22, 1981, 3330152; Sep. 22, 1981, 3330153
Int. Cl.³ E21B *7/26*
U.S. Cl. 175—19 **4 Claims**

1. A tool for forming earth holes having fixed walls, said tool comprising:
- a leading casing provided with a cylindrical portion and frontal and rear conical tips, said frontal and rear conical tips being provided with spiral tapered surfaces for consolidating soil and said frontal and rear conical tips each being disposed on one side of said cylindrical portion;

a trailing casing disposed above said leading casing coaxially with the leading casing and said trailing casing being provided with a cylindrical portion whose diameter is greater than that of said cylindrical portion of said leading case, the diameter of the cylindrical portion of said trailing casing corresponding to the diameter of the hole being formed;

a frontal conical reamer positioned below the cylindrical portion of said trailing casing and said frontal conical reamer provided with spiral tapered surfaces for consolidating soil;

an axial duct defined by the trailing casing; and

a tubular element connecting said leading and trailing casings, said tubular element communicating with the axial duct in said trailing casing and said tubular element being provided with ports.

3. A method of forming earth holes having fixed walls, said method comprising the steps of:

(a) forming a pilot hole whose diameter is smaller than a predetermined diameter, using a tool comprising a leading casing with a cylindrical sizing portion, a trailing casing disposed above said leading casing, and a tubular element connecting said leading and trailing casings, communicating with an axial duct in said trailing casing, and provided with a port for discharging fixing materials into the hole;

(b) forming a hole of the predetermined diameter with said tool with advance of the step (a);

(c) feeding the fixing material into the pilot hole at the regions thereof to be fixed;

(d) lifting the tool after forming the hole of the predetermined diameter until the tool leaves the pilot hole;

(e) feeding the fixing material into the hole following the step (d), and then

(f) repeated sinking of the hole, whereby the fixing material is pressed into the walls and the bottom of the hole; and

(g) withdrawing the tool from the finished hole.

4,496,012
METHOD FOR IMPROVING CUTTINGS TRANSPORT IN DEVIATED WELLS

Joseph G. Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,914
Int. Cl.³ E21B *43/00*
U.S. Cl. 175—65 **4 Claims**

1. A method for increasing the cuttings transport efficiency during the drilling of a deviated well in the earth, comprising the steps of:

(a) circulating a drilling fluid through said deviated well having a viscosity sufficient to transport non-entrapped cuttings up the annulus of said deviated well between the drill string and the borehole wall to the earth's surface, and

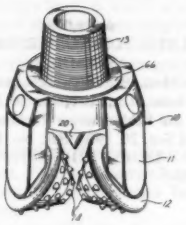
(b) periodically terminating the circulation of said drilling fluid and injecting a slug of a shear thickening fluid which is spotted for a predetermined time period, and

(c) resuming the circulation of said drilling fluid after said predetermined time period whereby said injected slug of thickening fluid will undergo a locally increased viscosity change during circulation due to an increased shear stress along the length of the face of any cuttings bed that may have formed in that part of said annulus where the drill string lies along the lower side of the borehole wall, whereby said cuttings bed is dislodged, the lower injection viscosity of said slug of fluid being sufficient to transport the dislodged cuttings up the remaining portion of said annulus to the earth's surface.

4,496,013
PREVENTION OF CONE SEAL FAILURES IN ROCK BITS

Richard E. Serpa, Arcadia, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 23, 1982, Ser. No. 410,428
Int. Cl.³ E21B *10/08*
U.S. Cl. 175—374 **16 Claims**



1. A rock bit for drilling subterranean formations comprising:

a steel bit body including a dome and a plurality of legs, each leg having a journal pin;

a cutter cone mounted on each journal pin;

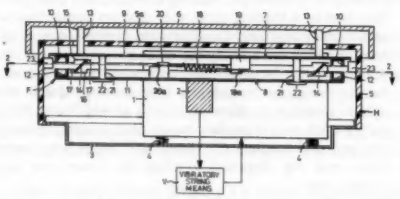
a cone seal at the base of each journal pin between the journal pin and cutter cone; and

a sacrificial anode electrically connected to the dome of the bit body comprising a shape for diverting flow of drilling mud around the cutter cones, said anode being formed of a material less noble than steel.

4,496,014
WEIGHING APPARATUS INCLUDING OVERLOAD PROTECTION MEANS

Ernst Willi, Dürnten, Switzerland, assignor to Mettler Instrumente AB, Greifensee, Switzerland

Filed Mar. 22, 1983, Ser. No. 477,723
Claims priority, application Switzerland, Jul. 20, 1982, 4412/82
Int. Cl.³ G01G *21/10*
U.S. Cl. 177—187 **7 Claims**



1. Weighing apparatus, comprising

(a) a hollow housing (3,5) containing a chamber;

(b) load cell means mounted within said housing chamber and including a stationary member (1) and a vertically movable load receiving member (2);

(c) a weighing pan (6) arranged above said housing; and

(d) means including overload protection means connecting said weighing pan with said load receiving member, said connecting means including

(1) upper and lower open generally-rectangular vertically spaced frame members (7,8) mounted horizontally within said chamber concentrically about said stationary load cell member;

(2) means connecting said upper and lower frame members

with said weighing pan and with said load receiving member, respectively; and

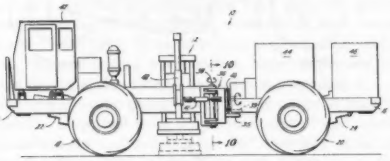
(3) snap spring means **(14,18)** normally biasing said upper frame member upwardly relative to said lower frame member to establish an operating condition in which a force applied to said weighing pan is transmitted to said load receiving member via said upper frame member, said snap spring means, and said lower frame member, said snap spring means being operable, when an overload force is applied to said weighing pan that exceeds the biasing force of said snap spring means, to relax said frame members and thereby isolate said load receiving member from said weighing pan.

4,496,015

INTERCHANGEABLE DRIVE MEANS FOR A VEHICLE

James A. Porter, Jr., Houston; Joe D. Shivers, Friendswood; Marek Rozycki, Houston, and Otis Johnston, League City, all of Tex., assignors to Litton Resources Systems, Inc., Alvin, Tex.

Filed Aug. 30, 1982, Ser. No. 412,428
Int. Cl.³ B60D *7/00;* **B60P** *1/04*
U.S. Cl. 180—9.26 **3 Claims**



1. An articulated vehicle for cross country seismic exploration comprising:

a front bed frame and a rear bed frame pivotally coupled relative to each other about a vertical axis and a longitudinal axis;

first pair of drive means having a first configuration disposed so as to support each said bed frame, each said drive means being capable of receiving motive power from separate and independent power sources,

a self-contained means for enabling the replacement of said first drive means having a first configuration by second drive means having a second different configuration, under said front bed frame, said second drive means being capable of receiving motive power from a first independent power source; and

a detachable means for inhibiting relative rotation of said bed frame about said longitudinal axis when said enabling means is operative to enable the replacement of said first drive means having a first configuration by a second drive means having a second configuration beneath said rear bed frame, said second drive means being capable of receiving motive power from a second independent power source.

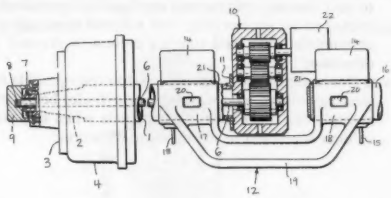
4,496,016

LAND VEHICLES

Derek Unsworth, 4 Farmside, Borris Park, Wrexham, Clwd, Wales, and Edward J. Diggs, 8 Lime Tree Dr., Frandon, Cheshire, England

Filed Nov. 10, 1982, Ser. No. 440,621
Claims priority, application United Kingdom, Oct. 15, 1982, 8229544; Oct. 15, 1982, 8134024
Int. Cl.³ B60K *17/28, 25/08*
U.S. Cl. 180—53.6 **12 Claims**

1. In a wheeled land vehicle having a non-rotary hollow axle shaft, a free-running ground-engaging wheel on one end of said shaft, a power take-off input shaft extending coaxially through said axle shaft, a power take-off mechanism, and means drivingly connecting the said power take-off shaft to the said wheel at the outer end of the shaft and to the said power take-off mechanism at its inner end, the improvement comprising, in combination: the axle shaft being divided in its length to provide a space for locating the said power take-off mechanism on the axle shaft axis, a bridge rigidly connecting the two parts of



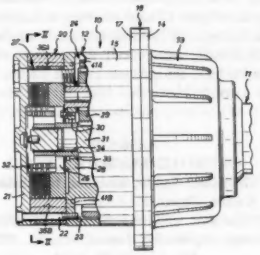
the axle shaft and having a part thereof laterally displaced from the axle shaft axis to provide said space for the said power take-off mechanism, said mechanism being mounted in said space in cantilever fashion on the inboard termination of the outer one of said axle shaft parts.

4,496,017

WHEEL HUB ASSEMBLY WITH INTEGRATED REDUCTION GEAR AND BRAKE MECHANISM

Léonce Rogier, Saint-Denis, France, assignor to Valeo, Paris, France

Filed Dec. 20, 1982, Ser. No. 451,441
Claims priority, application France, Dec. 22, 1981, 81 23949
Int. Cl.³ F16D *55/02, 65/84*
U.S. Cl. 180—70.1 **7 Claims**



1. A wheel hub assembly for heavy-duty vehicles, said wheel hub assembly comprising a hollow body adapted to contain a liquid lubricant and having a first compartment for housing a wheel drive reduction gear and a second compartment adjacent to said first compartment for housing a wheel brake mechanism, said hollow body including a sidewall, at least a portion of said sidewall which annularly surrounds one of said compartments has at least a pair of longitudinally extending, oppositely sloping generally oblique grooves defining means for longitudinally circulating the liquid lubricant between said compartments when said wheel hub assembly is in operation.

4,496,018

STEERING COLUMN-OPERATED ACCELERATING AND BRAKING DEVICE FOR AUTOMOBILES

Lo Hsin-Min, 47, Shih Chien St., Hsin Chu City, Taiwan

Filed Apr. 13, 1983, Ser. No. 484,615
Int. Cl.³ B62D *1/18*
U.S. Cl. 180—78 **5 Claims**

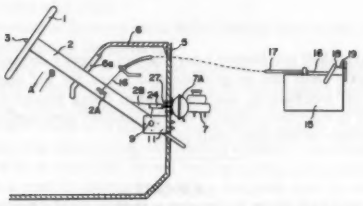
1. A steering column-operated accelerating and braking device for automobiles, comprising:

a steering column having an upper end and a lower end, the

upper end having a steering wheel rotatably mounted thereto and the lower end being pivotally mounted with a mounting base onto a structural part of the automobile so that the upper end of the column can be selectively moved fore and aft;

an accelerator cable having one end operatively connected to said steering column and another end operatively connected to an accelerating unit adapted to accelerate the automobile when said steering column is pivoted in one direction;

a master brake cylinder having a piston rod operable by said steering column, said master brake cylinder being adapted to apply the brake on the automobile when said steering column is pivoted in the opposite direction;



magnetic means for holding said steering column in position when it is not being selectively moved fore and aft;

wherein said magnetic means comprises a magnetic holding device to hold said steering column in fixed position when said steering column is not being pivotally operated;

wherein said magnetic holding device is provided on said mounting base and disposed in a frictional engagement with a pivotal part of said steering column; and

wherein said magnetic holding device is an electromagnetic piece electrically connected to a series electric circuit having a battery, an ignition switch of the automobile, a fuse and a control switch.

4,496,019

OFFROAD AUTO TRICYCLE

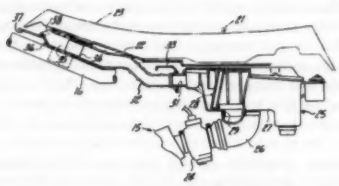
Ko Tanaka, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Jun. 18, 1982, Ser. No. 389,954

Claims priority, application Japan, Jun. 22, 1981, 56-96150

Int. Cl.³ B62K *5/04*

U.S. Cl. 180—215 **7 Claims**



1. In an induction system for an off the road vehicle having a pair of driven rear wheels and at least one dirigible front wheel, an engine positioned continuous to said rear wheels and having a rearwardly facing induction system inlet, a seat extending forwardly from said rear wheels, and an air cleaner positioned in proximity to and to the rear of said engine and said induction system inlet and contiguous to said rear wheels, the improvement comprising an inlet device comprising an elongated tube means terminating at an outlet end rearwardly of the engine and communicating with a forwardly facing inlet of said air cleaner for supplying air to said air cleaner from an inlet end forwardly of the engine and disposed in a protected area contiguous to the front of said vehicle, said inlet end being disposed so that foreign materials will be precluded from entry thereto, an outlet from said air cleaner, and conduit means connecting said air cleaner outlet with said induction system inlet.

4,496,020

V-TYPE MULTI-CYLINDER ENGINE FOR MOTORCYCLE

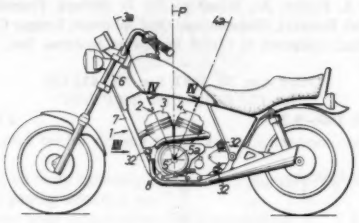
Toshiro Mitsuishi, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

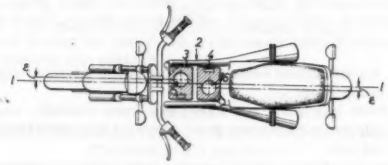
Filed Dec. 23, 1982, Ser. No. 452,431

Claims priority, application Japan, Dec. 26, 1981, 56-209518

Int. Cl.³ B62D *61/02*; **F16F** *15/26*

U.S. Cl. 180—219 **10 Claims**





1. A V-type multi-cylinder engine for motorcycles, including first and second engine blocks arranged on a frame so as to form a V shape, said engine blocks having first and second cylinders, respectively, pistons reciprocatably and slidably received by said first and second cylinders, and a crankshaft having first and second crank pins connected through piston rods to said pistons, wherein the improvement comprises that the rotational phase of said second crank pin is offset from that of said first crank pin by an angle $\pi - 2\alpha$ in the opposite side of the central axis of said first cylinder to the axis of said second cylinder, α representing an angle included between the central axes of said first and second cylinders, and that a balancer weight is attached to that portion of said crank shaft positioned opposite to said first and second crank pins and on the bisector line of the angle formed between said crank pins around said crankshaft.

4,496,021

360 DEGREE RADIAL REFLEX ORTHOSPECTRAL HORN FOR HIGH-FREQUENCY LOUDSPEAKERS

Emmanuel Berlant, 5600 Kensington Way, #206, Culver City, Calif. 90230

Filed Feb. 18, 1983, Ser. No. 467,736

Int. Cl.³ H05K *5/02*

U.S. Cl. 181—152 **13 Claims**

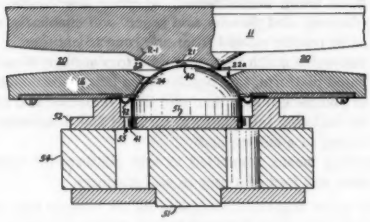
1. A 360° radial reflex orthospectral expanding acoustical horn loudspeaker for high frequency operation having a wide frequency band of operation and relatively uniform amplitude output over the wide frequency band, said loudspeaker comprising:

a. an electro-acoustic driver coupled into an annular throat

having a width approximately a quarter-wavelength of the highest frequency to be reproduced by the loudspeaker;

b. a first annular horn coupled to said throat and disposed at an upward and outward angle to the axis of said driver, said first annular horn expanding at a predetermined first rate;

c. said first annular horn being reflectively coupled into a second annular horn extending on a horizontal axis radially from said first annular horn, said second annular horn



having a different expansion rate than said first annular horn, and successive annular elements of said second annular horn being coupled to one another, each successive element having a somewhat larger expansion rate than the expansion rate of the element preceding it,

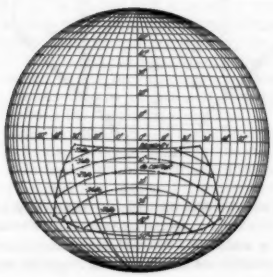
d. whereby acoustic energy over a wide range of high frequencies is emitted from the ultimate one of said annular acoustical horn elements over 360° laterally from said radial orthospectral loudspeaker, with relatively uniform amplitude over said wide range of high frequencies.

4,496,022

SYSTEM FOR INTERRELATING SOUND TRANSDUCERS OR SOUND SOURCES AND THEIR ENVIRONMENT

John R. Prohs, 233 S. Orange Grove Blvd., Apt. 233, Pasadena, Calif. 91105

Filed Feb. 22, 1983, Ser. No. 468,850
Int. Cl.³ G10K *11/00*
U.S. Cl. 181—175 **16 Claims**



1. A method of selection and positioning of a transducer in an environmental volume, comprising the steps of:

a. mapping selected positions in the volume on a spherical surface, the surface having a radial center representing the position of the transducer;

b. overlaying on the mapped spherical surface a mating spherical map of spatial characteristics of the transducer;

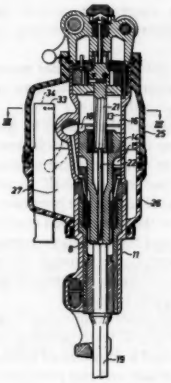
whereby a distortion-free spherical-surface composite map of the transducer characteristics and volume positions is provided to enable selection and positioning of a transducer appropriate to the positions.

4,496,023

PNEUMATICALLY OPERATED IMPACT TOOL

Eric T. Lindberg, Bromma, and Anna M. Friedman, Älta, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sep. 12, 1983, Ser. No. 531,603
Claims priority, application Sweden, Sep. 16, 1982, 8205318
Int. Cl.³ F01N *1/08*
U.S. Cl. 181—230 **1 Claim**



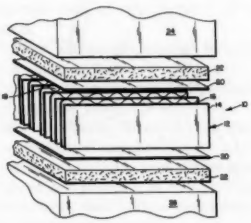
1. Pneumatically operated impact tool in which a pneumatically actuated hammer piston (**14**) is reciprocable in a cylinder (**13**) to repeatedly impact upon an anvil (**8**) and an exhaust chamber (**27**) is arranged to receive the exhaust air from the cylinder, said exhaust chamber having at least one outlet tube (**31,32**) that has its inlet end inside said exhaust chamber, characterized by a number of holes (**35, 36**) through the tube (**31, 32**) adjacent the inlet end thereof so that air will flow from the exhaust chamber (**27**) to the tube (**31, 32**) both through the inlet of the tube and through said holes which hava a small total area as compared to the area of the inlet of the tube.

4,496,024

SOUND ABSORPTION PANEL AND METHOD OF MAKING

Jerry M. Wolf, Westerville, and Wilbur D. Holben, Ostrander, both of Ohio, assignors to Midwest-Acoust-A-Fiber, Inc., Ostrander, Ohio

Filed Aug. 26, 1983, Ser. No. 526,894
Int. Cl.³ E04B *1/82*
U.S. Cl. 181—292 **15 Claims**



1. A method of making a sound absorption panel comprising,

assembling a substantially planar sandwich structure of two fiberglass pelts, two non-porous thermoplastic sheets and a paper honeycomb core in the sequence pelt-sheet-core-sheet-pelt;

said assembled pelts each having a density in the range of about twelve to about forty Kg/m^3 and incorporating about sixteen to about twenty-five percent by weight of

phenolic resin; said assembled sheets being selected from the group consisting of polypropylene, polyethylene, polyvinylchloride, and polyvinylacetate and having a thickness in the range of about 0.013 mm to about 0.102 mm and the assembled honeycomb structure having a thickness in the range of about twenty-five to thirty-eight mm and with the cells of the honeycomb oriented perpendicular to the plane of the sheets;

arranging the pelts, sheets and core to have substantially coextensive peripheries and between a pair of planar presses,

moving the presses toward each other to compress the pelts to no more than about one-fourth their original thickness without compressing the core,

stopping the movement of the presses by means unrelated to the resistance force of the sandwich structure,

heating the presses to a temperature of about 450° F. for a period of about one and one-half to about three annd one-half minutes to (1) cause the phenolic resin to hold the fibers of the pelts in the compressed condition and (2) melt the thermoplastic and thereby allow passage of gases from the cells of the honeycomb through the pelts;

cooling the sandwich to freeze the melted thermoplastic and thereby bond the pelts to the core.

9. A sound absorption panel comprising a paper honeycomb core having a plurality of cell walls defining cells and first and second cell end planes, and a compressed porous fiberglass pelt bonded to at least one of said cell end planes by melted thermoplastic wherein the thermoplastic has penetrated the fibers of said fiberglass pelt and flowed around the edges of said cell walls, said core and pelt having the physical property of allowing gas to pass through the pelt into the cells of the core, said pelt including about sixteen to about twenty-five percent by weight of phenolic resin binder and having a density in the range of about 96 to about 289 Kg/m^3,

said thermoplastic being selected from the group consisting of polypropylene, polyethylene, polyvinylchloride, and polyvinylacetate.

4,496,025

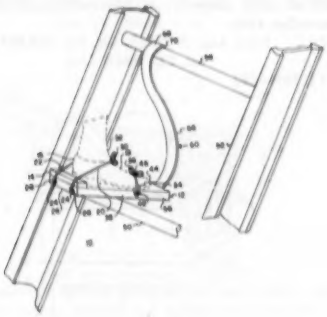
FOOT SUPPORT FOR LADDER

John W. Gattman, 801 E. Sixth St., Muscle Shoals, Ala. 35660

Filed May 16, 1983, Ser. No. 495,145

Int. Cl.³ E06C 7/16; A43B 3/00

U.S. Cl. 182—121 **11 Claims**



1. A support for supporting an individual shoe of a wearer on a ladder comprising:

a generally rigid, elongated platform having a generally planar upper surface and being sized to approximate the length and width dimensions of a single shoe, said platform having a front region and a back region to coordinately receive the toe and heel regions of a shoe, said platform including a vertically extending region in at least a portion of said back region of said upper surface and configured to block rearward movement of the heel of said shoe;

an elongated brace having a first end region fixedly secured to said front region of said platform, said brace extending upward above said front region and having an end region configured in the shape of an open U-shaped hook having a turned forward and downward region for removably extending over and partially around a rung of a ladder for supporting said front region of said platform, and the region below the opening formed by said open U-shaped hook being unobstructed, whereby any raising of said platform, and thereby said brace, will enable the support to be readily moved from one rung to another;

a transverse notch region in a bottom surface of said elongated platform, said notch region being positioned closer to said back region than said front region of said platform for inclining said platform forward and downward about a rung of a ladder; and

securing means connected to said platform for securing a shoe and foot of a user to said platform.

4,496,026

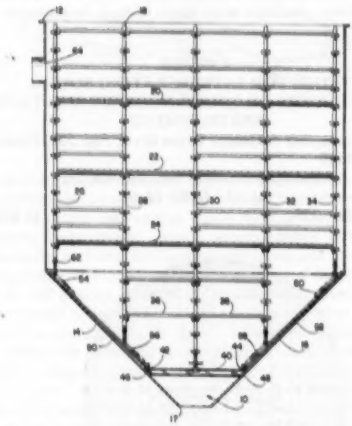
FOUNDING LADDER SYSTEM

Richard G. Meehan, Laguna Niguel, Calif., assignor to Kwikform America, Inc., Fountain Valley, Calif.

Filed Aug. 10, 1981, Ser. No. 291,275

Int. Cl.³ E04G 1/36, 3/02

U.S. Cl. 182—128 **32 Claims**



1. A readily assemblable system for supporting scaffolding inside a boiler having a converging pair of downwardly sloping lower boiling walls, said assemblable system capable of use with a variety of different size boilers having different internal configurations, wherein said system comprises:

a generally horizontal founding truss for spanning between said lower boiler walls; and

a pair of sidewall supports mounted on opposite ends of said founding truss for extending upwardly from said truss and along the lower boiler sidewalls, said sidewall supports contacting said boiler sidewalls, transferring a portion of the weight of said scaffolding to said downwardly sloping boiler walls; and

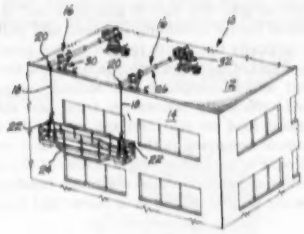
detachable post support means adapted for positioning at any of a plurality of locations along the length of said sidewall supports, said support means adapted to connect said scaffolding to said sidewall supports.

4,496,027

MOBILE OUTRIGGER FOR SUSPENDING SCAFFOLD

Harry S. Fisher, Renton, Wash., assignor to Spider Staging, Inc., Renton, Wash.

Filed Jan. 31, 1983, Ser. No. 462,303
Int. Cl.[3] E04G 3/10
U.S. Cl. 182—142 33 Claims



1. An end support for an elongated outrigger beam which during use is supported on a building roof or the like, by a pair of such supports, spaced apart longitudinally of the beam and supporting such beam with an outboard end portion thereof extending outwardly from the side of the building, to provide an upper end support for a suspended staging, said end support comprising:

a frame having an upper portion connectable to the beam, and first and second support feet spaced apart from each other, laterally of the beam, with the first support foot being located on one side of the beam and the second support foot being located on the opposite side of the beam;

a wheel mounted on said frame between the support feet, for rotation about an axis which is parallel to the beam;

means for adjusting the relative vertical positions of the first and second support feet and a lower support surface contacting portion of the wheel, between a first position in which the first and second support feet are both on the support surface and the wheel is elevated above the support surface, and the system is fixed in position on the support surface, and a second position in which the wheel is down on the support surface and both support feet are spaced above the support surface, and the system is mobile on the wheel, said means for adjusting comprising means for moving the second foot in position vertically relative to said frame, between a lower position in which said first and second support feet are both on the roof or other support surface and the wheel is elevated above the support surface, and an upper position in which the wheel is down on the support surface and both support feet are spaced above the support surface; and

a small caster mounted on said frame proximate the second foot, said caster being positioned to be elevated above the support surface contacting portion of the wheel when the second support foot is in said lower position and to be in contact with the support surface when the said second support foot is in its said upper position, so that when the second support foot is in its said upper position, the end support is supported for movement by said wheel and said caster.

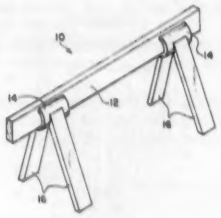
4,496,028

INSTANT SAWHORSE

Theodore A. Peterson, P.O. Box 113, Chuluota, Fla. 32766

Filed Feb. 21, 1984, Ser. No. 581,737
Int. Cl.[3] F16M 11/00
U.S. Cl. 182—186 11 Claims

1. A sawhorse member utilizing no nails or other fasteners in its construction, comprising an elongate, generally circular member having a comparatively thick sidewall, but being otherwise hollow, said member being made of resilient material, with its sidewall being longitudinally cut for its entire length in a direction generally parallel to the centerline of said generally circular member, thus in effect to define a generally circular spring, a pair of holes cut through the sidewall of said generally circular member at a location substantially opposite from said longitudinal cut, said holes being circumferentially spaced apart, and each being substantially equidistant from the



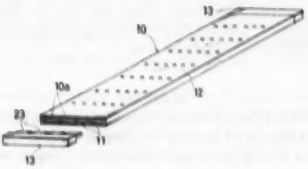
ends of said circular member, each of said holes being arranged to receive the upper end of an elongate leg member, whereby as the bottoms of said leg members are drawn together, the edges of said cut are caused to move apart, so as to be able to receive the central beam of a sawhorse, and to tightly grasp such beam in a pincers-like grip when said leg members are released.

4,496,029

SCAFFOLD PLANK

Shigeharu Kuroda, No. 1-13, Tomigaoka 5-chome, Nara, Japan

Filed Mar. 30, 1983, Ser. No. 480,452
Int. Cl.[3] E04G 5/08
U.S. Cl. 182—222 20 Claims



1. A scaffold plank which comprises

a plurality of hollow elongated members arranged in side-by-side contact relationship to one another to provide a plurality of transversely aligned, opening mouths respectively at opposite ends of said plurality of hollow elongated members,

each of said hollow elongated members being substantially rectangular in cross section,

each of said hollow elongated members including a pair of opposed vertical side walls,

at least one layer of covering member enclosing said plurality of hollow elongated members,

a pair of end members serving as connectors mounted to said opposite ends of said plurality of hollow elongated members for maintaining said hollow elongated members in side-by-side contact relationship,

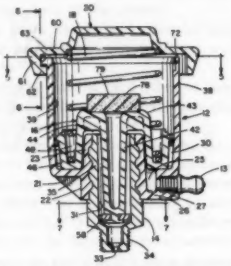
each of said pair of end members including a plurality of plug portions which are transversely aligned in spaced-apart relation and inwardly project into mating engagement with said plurality of transversely aligned opening mouths, and

each of said pair of end members further including inner engaging walls which are in abutment with end walls of said plurality of hollow elongated members.

4,496,030
AUTOMATIC LUBRICATION ASSEMBLY

John A. Gloviak, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 7, 1983, Ser. No. 473,072
Int. Cl.³ F16N 11/04
U.S. Cl. 184—45 R 18 Claims

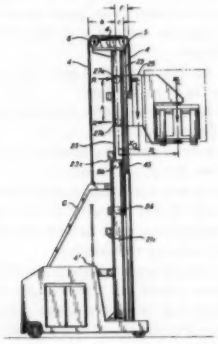


11. An automatic lubrication assembly comprising; an one-piece plastic base and lubricant reservoir cup, an outlet fitting connected to the base constructed of metal and having an outlet opening communicating with the reservoir cup and adapted to be connected to the machine to be lubricated, said cup having an open rear end, a plunger slidable in the cup, a spring biasing the plunger in a direction to dispense lubricant in the reservoir cup through the outlet fitting, and an easily removable cap over the open end of the reservoir cup against which one end of the spring reacts, whereby the spring may be changed to vary the flow of lubricant by removing the cap without contacting lubricant in the reservoir cup, a clearance between the removable cap and the cup communicating with the exterior of the assembly, and axially extending recess means in the interior of the cup adjacent the open end adapted to carry overflow lubricant from the cup to the clearance when the piston reaches its extreme rearward position to prevent overfilling the reservoir cup.

4,496,031
MATERIAL HANDLING APPARATUS

Ralph E. Allen, and Christian D. Gibson, both of Greene, N.Y., assignors to The Raymond Corporation, Greene, N.Y.

Continuation-in-part of Ser. No. 31,187, Apr. 18, 1979, abandoned.
This application Feb. 7, 1980, Ser. No. 114,911
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 R 17 Claims

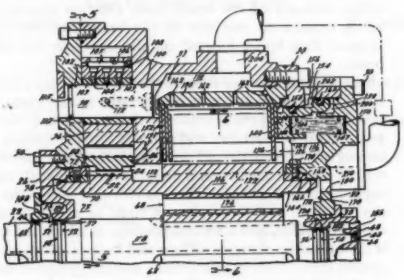


1. In a lift truck mast assembly which includes a vertically-extending mast having pulley means journalled on said mast adjacent the upper end of said mast, a load carriage guided for vertical movement by said mast, lift cable means connected to said load carriage and trained over said pulley means to suspend said load carriage on said mast, said load carriage being adapted to carry a load with the center-of-gravity of said load horizontally displaced from said mast on a forward first side of said mast whereby said load carriage applies a force couple to said mast, said lift cable means including at least one first vertical course extending between said pulley means and said load carriage on said first side of said mast and at least one second vertical course extending between said pulley means and means vertically fixed with respect to said mast on a second rearward side of said mast opposite from said first side, the improvement which comprises said second vertical course being spaced sufficiently rearwardly from said mast that a maximum rated load on said carriage causes the maximum bending moment occurring in the portion of said mast below said force couple to be within 70% to 130% of the magnitude of and opposite in direction to the maximum bending moment occurring in the portion of said mast above said force couple.

4,496,032
BRAKE UNIT

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Division of Ser. No. 333,314, Dec. 22, 1981, Pat. No. 4,424,887, which is a continuation of Ser. No. 80,456, Oct. 1, 1979, abandoned. This application Jul. 29, 1983, Ser. No. 518,664
Int. Cl.³ B60T 8/12; F16D 65/78, 57/00
U.S. Cl. 188—180 5 Claims



1. A self-brake assembly for a drawworks of the oil shear type having automatic speed governing means, said drawworks including apparatus for raising and lowering stands of pipe; comprising:

a housing;

an input shaft rotatably journaled within said housing and rotatably associated with said apparatus for raising and lowering stands of pipe;

a plurality of brake discs axially movably mounted on said input shaft and rotatable therewith;

a plurality of brake plates nonrotatably axially movably mounted within said housing and interposed between said brake discs;

clamping means for axially moving said brake discs and said brake plates into braking relationship;

control means for releasing said clamping means whereby said input shaft is allowable to rotate; and

means responsive to the speed of rotation of said input shaft only in one direction of rotation for overriding said control means and causing said clamping means to move said brake discs and said brake plates into braking relationship to automatically keep the speed of said shaft below a selected speed, wherein said means for overriding is entirely unresponsive to rotation of said input shaft in the opposite direction to said one direction, said speed of rotation responsive means comprising fluid pumping means driven by said input shaft and operative to generate

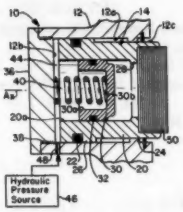
a fluid pressure, the magnitude of said pressure varying directly with the speed of rotation of said input shaft, and passage means within said housing for conducting said fluid pressure to said clamping means.

4,496,033

DUAL PISTON ACTUATOR

John M. Hall, Uniontown, and Milan Pantic, Akron, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 28, 1981, Ser. No. 334,707
Int. Cl.³ B60T *11/00*; F01B *7/20*
U.S. Cl. 188—347 **1 Claim**



1. In an aircraft hydraulic disk brake system, an actuator for applying an axial force on a disk brake stack to effect brake actuation by compression of the disk stack comprising:

a housing defining a primary bore having a closed end and an open end and a central axis;

a primary piston slidably and sealingly mounted within the primary bore to move axially within the bore to effect an output brake actuation force, said piston defining a secondary bore axially aligned with the primary bore;

a secondary piston slidably and sealingly mounted within the secondary bore, said primary and secondary pistons and the closed end of the housing defining a pressure chamber;

a tension spring fastened to the closed end of the housing at one of its ends and to the secondary piston at the opposite end to apply a reverse bias on said secondary piston; and

means communicating hydraulic fluid pressure to the pressure chamber to provide an increasing pressure force on said pistons, the primary piston movable in response to the hydraulic pressure to provide an output force that effects brake actuation while the secondary piston moves with the primary piston and adds to the output actuation force only when the hydraulic pressure exceeds a threshold value as established by the tension spring and the relative area of the pistons whereupon the secondary piston engages the primary piston and the combined effect of the primary and secondary pistons provides an increasing output brake actuation force.

4,496,034

VISCOUS COUPLING FOR TORQUE CONVERTER BYPASS

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 15, 1982, Ser. No. 388,557
Int. Cl.³ F16D *39/00*
U.S. Cl. 192—3.28 **18 Claims**

1. A viscous coupling for use as a bypass element in a torque converter transmission including a torque converter housing containing a torque converter having an output shaft, said coupling comprising:

(A) an annular housing assembly adapted to be positioned within the torque converter housing and having axially spaced, radially extending annular side wall members defining an annular chamber therebetween containing a viscous fluid;

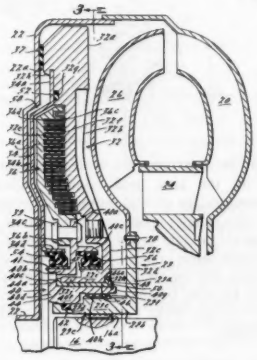
(B) a radially extending annular clutching surface defined on an outer peripheral portion of said annular housing assembly and adapted for clutching coaction with a confronting inner surface of the torque converter housing;

(C) an annular clutch assembly disposed within said chamber in the viscous fluid and including:

1. an annular radially extending portion having working means on an annular side face thereof for clutching coaction with corresponding clutching means on a confronting annular face on one side wall member of said annular housing assembly; and

2. an annular axially extending hub portion adapted to be drivingly connected to the torque converter output shaft;

(D) an annular axially extending hub portion defined at a radially inner edge of said one side wall member of said annular housing assembly, said hub portion having radially inner and outer peripheral surfaces, and said inner peripheral surface journaled on the outer peripheral surface of the hub portion of said clutch assembly and providing the sole load bearing support for said annular housing assembly;



(E) an annular axially extending lip portion defined at a radially inner edge of the other side wall member of said annular housing assembly disposed in spaced, non load-bearing relation to said clutch assembly; and

(F) a first seal disposed between the radially outer peripheral surface of the hub portion of said one side wall member and a radially inwardly directed, axially extending confronting surface on said clutch assembly; and

(G) a second seal disposed between a peripheral surface of said lip portion of said other side wall member and a confronting surface on said clutch assembly.

4,496,035

NEUTRALIZING MECHANISM FOR A HYDROSTATIC TRANSMISSION

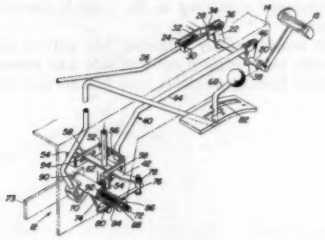
Lee J. Wanie, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jun. 21, 1982, Ser. No. 390,148
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 C **5 Claims**

1. In a hydrostatic transmission control including a control arm secured to a transmission control element and movable about a pivot axis among a central neutral position and forward and reverse drive positions, respectively, in opposite directions from the neutral position, the improvement comprising: said pivot axis being located intermediate the length of the control arm; a neutralizing member mounted for movement generally crosswise to the length of said arm and including a pair of spaced legs extending in the direction of movement of the member; said legs each being provided with a slot; said arm being positioned in the slots of the legs with the legs being

located at opposite sides of the pivot axis of the arm; first and second abutments respectively located on said spaced legs to engage a common surface of the arm at locations on opposite sides of the axis and at least one of the abutments being formed by an end of one of the slots;

said neutralizing member being movable between a disengaged position wherein the abutments are spaced from said arm sufficiently to permit the arm to move freely between extreme forward and reverse drive positions and an engaged position, corresponding to the neutral position



of the arm, wherein both abutments are in engagement with the arm; said control including a brake pedal mounted for pivotal movement between brake-release and brake-engage positions; and a brake control linkage connected to said pedal by a lost motion connection and a transmission control linkage being conected between the pedal and the neutralizing member such that the neutralizing member begins movement toward its engaged position before the brake pedal begins to move the brake control linkage.

4,496,036

TORSIONAL DAMPERS

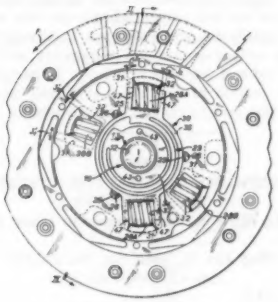
Pierre Loizeau, Ville D'Avray, France, assignor to Valeo, Paris, France

Filed Nov. 2, 1981, Ser. No. 317,175

Claims priority, application France, Nov. 3, 1980, 80 23447; Nov. 3, 1980, 80 23446

Int. Cl.³ F16D *3/66*

U.S. Cl. 192—106.2 **25 Claims**



1. A torsional damper suitable for use in a friction clutch plate, comprising at least two coaxial parts mounted to rotate relative to each other within a defined range of relative angular movement, circumferentially acting elastic means between said parts resisting such relative angular movement and incorporating at least one elastically deformable arm of thin plate configuration, two support members between which said elastically deformable arm extends and with at least one of which it is integral via a root area, means for positively engaging one of said support members with one of said parts so as to rotate therewith, and drive means on the other of said support members for engaging it for rotation with the other of said parts for at least part of said defined range of relative angular movement, wherein a first of said parts includes a hub designed to engage on a shaft so as to rotate therewith and a first of said support members is in the form of a slotted ring with an internal profile analogous to that of said hub so as to engage on the aforementioned shaft so as to rotate therewith, whereby said first support member is engaged with said first part so as to rotate therewith via the aforementioned shaft.

4,496,037

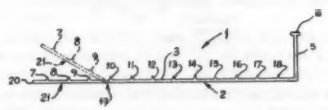
GRAVITY-FEED SHELF AND COMPONENTS THEREFOR

William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 210,964, Nov. 28, 1980, abandoned. This application Jan. 19, 1983, Ser. No. 459,090

Int. Cl.³ A47F *7/00*

U.S. Cl. 193—2 R **2 Claims**



1. A plastic track component for a gravity feed shelf comprising a web panel having an upper article supporting surface, a flange panel integral with one side edge of said web panel and forming therewith a substantially "L"-shaped structure, a plurality of spaced ribs formed on said article supporting surface and extending the length of said web panel parallel with said flange panel, said ribs projecting upwardly from said article supporting surface and being of generally triangular cross section, an elongate notch formed in said web panel and extending parallel to and adjacent the other side edge of said web panel and remote from said flange panel and providing a frangible zone by which a portion of said web panel between said notch and said other side edge can be broken away from said web panel so as to reduce the width of said web panel, said notch extending the length of said web panel intermediate a pair of said ribs and being formed in the surface of said web panel opposite to said article supporting surface, said track component being formed of high-impact polystyrene having a lubricant material dispersed therein.

4,496,038

MECHANISM FOR DIRECT TRANSMISSION OF FEED MOVEMENTS TO THE OPERATING UNITS OF AN AUTOMATIC MACHINE WITH REVOLVING TABLE

Aldo Mandozzi, Ponte Capriasca, Switzerland, assignor to Azypatent AG, Vaduz, Liechtenstein

Filed Jul. 1, 1982, Ser. No. 394,471

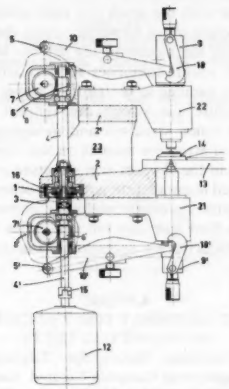
Claims priority, application Switzerland, Jul. 9, 1981, 4524/81

Int. Cl.³ B65G *47/00*

U.S. Cl. 198—339 **6 Claims**

1. An automatic machine with a revolving table having a plurality of work stations spaced about the table, upper and lower operating units at each said station for performing working operations on a workpiece, a toothed wheel for each work station, an endless flexible toothed member engaging all the toothed wheels so as to drive them simultaneously and in synchronism, at least one motor to circulate the endless flexible member, an upper shaft and a lower shaft being driven in rotation by each said toothed wheel, upper speed reduction members and an upper cam and an upper roller and an upper lever drivingly interconnecting the upper shaft with the upper

operating unit of each work station, and lower speed reduction members and a lower cam and a lower roller and a lower lever



drivingly interconnecting the lower shaft with the lower operating unit of each work station.

4,496,039

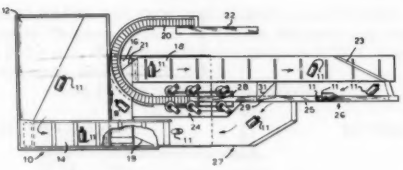
BOTTLE ALIGNMENT APPARATUS

Robert J. Krooss, 74 Ball Rd., Mountain Lakes, N.J. 07046

Continuation of Ser. No. 257,368, Apr. 24, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,018

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—396 **1 Claim**



1. Bottle alignment apparauts, for aligning a plurality of bottles having a base, main section and a neck in linear alignment, said apparatus comprising:

a downwardly sloping trough for receiving said bottles, said trough causing each of said bottles entering it to align its major axis with the general direction of said trough, and having said bottles move along said trough by gravity;

a movable wall, said wall being a part of an outer wall position of said trough where said movable wall is automatically opened to relieve a jammed condition in alignment chute caused by a plurality of bottles;

a slide surface fixed to an edge of said trough and being sloped upwardly from said edge and the upper portion said trough, a supply conveyor for supplying said bottles to said slide surface and placing said bottles on said slide surface, so that said bottles placed on a portion of said slide surface remote from said edge are in a non-upright position and are caused by gravity to slide toward said trough and where they further enter a stand-up chute;

a plow affixed to the bottom-most portion of said trough in a predetermined position, so as to divert and deflect a non-aligned bottle from a path followed by an aligned bottle, whereby a portion of randomly aligned bottles placed onto said slide surface leave from said downwardly sloping trough in a base leading or neck leading condition, and with the major axis of all of said bottles leaving in said portion being in linear alignment with the general direction of said trough: and

a return chute whereby said non-aligned bottles are returned to said supply conveyor.

4,496,040

APPARATUS FOR WIDENING AND SLOWING DOWN A STREAM OF UPRIGHT BOTTLES

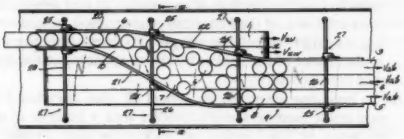
Hermann Kronseder, Worth, and Egon Schneider, Neutraubling, both of Fed. Rep. of Germany, assignors to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,554

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3228453

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—434 **6 Claims**



1. Apparatus having an input region for containers being transported longitudinally in single file and an output region for the containers after they have been rearranged in rows containing a plurality of containers substantially abreast of each other, comprising a longitudinally moving supply conveyor for feeding said containers into the input region, a longitudinally moving intermediate conveyor disposed adjacent and in parallelism with the supply conveyor and moving at a lower speed than the supply conveyor, and a longitudinally movable discharge conveyor disposed adjacent the intermediate conveyor and in parallelism therewith and moving at a lower speed than the intermediate conveyor, and

the improvement wherein the container supporting surfaces of said supply conveyor, at least in said input region, and said intermediate conveyor, and said discharge conveyor, at least up to the discharge region are all inclined to form a continual transversely inclined surface such that said containers will slide down the inclined surface from the supply conveyor to the discharge conveyor as they progress toward said output region.

4,496,041

APPARATUS FOR INTRODUCING PROJECTILES INTO ARTILLERY TURRETS

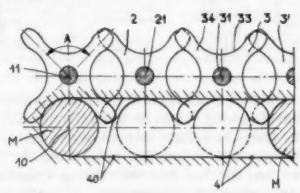
Hervé Voillot, Sartrouville, France, assignor to Creusot-Loire, Paris, France

Filed Jun. 3, 1982, Ser. No. 384,688

Claims priority, application France, Jun. 9, 1981, 81 11306

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—457 **5 Claims**



1. In an artillery turret installation, apparatus for transferring projectiles (M) from a feed corridor (**10**) along which said projectiles are moved axially in sequence, separated by safety intervals, into a transfer corridor (**4**) in which said projectiles

are moved side by side perpendicularly to their axes, said transfer corridor being defined by parallel guide members, a series of transfer star wheels (3') being mounted for rotation about axes at right angles to said guide members and rotationally driven in synchronism by a main drive means (33), each of said transfer star wheels (3') having at least one socket of a section corresponding to that of a said projectile, said socket being associated with two arms respectively taking over a projectile coming from a preceding star wheel and propelling it toward a succeeding star wheel, the improvement comprising:

(a) a receiving wheel (1) for receiving said projectiles (M) at the outlet of said feed corridor (10), said guide members extending to said receiving wheel, said receiving wheel having at least one socket for centering on the axis of said feed corridor by rotation about an axis (11) at right angles to said guide members, the safety interval separating said projectiles corresponding to the time required for replacement of a said socket by a succeeding socket;

(b) means (5, 53) for controlling, at regular intervals corresponding to the rhythm of succession of said projectiles at the outlet of said feed corridor, the rotation of said receiving wheel (1) through an angle (A) corresponding to the replacement of the socket by the next socket in the axis of said feed corridor;

(c) at least one intermediate wheel (2) also associated with said guide members and provided with a number of sockets equal to the number of sockets in said transfer star wheels, said intermediate wheel being interposed between said receiving wheel (1) and a first said transfer star wheel (3) for passing said projectiles (M) from one wheel to the other by rotation about an axis (21) at right angles to said guide members;

(d) means for continuously rotationally driving said intermediate wheel (2) at variable speed; and

(e) means (6, 7) for controlling periodic progressive variations of said speed of rotation between an angular velocity equal to that of said receiving wheel (1) and an angular velocity equal to that of said transfer star wheel (3) for each fraction of a revolution corresponding to the passing of an object from said receiving wheel to said transfer star wheel.

4,496,042

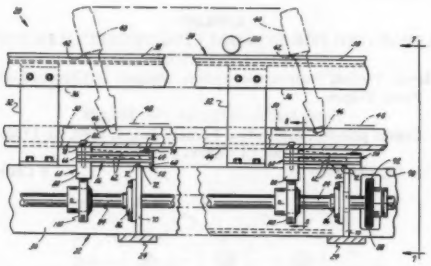
HUMPER CONVEYOR

William E. Rise, Utica, Mich., assignor to Android Corporation, Auburn Heights, Mich.

Filed May 24, 1982, Ser. No. 381,613

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—774 **15 Claims**



13. In a humper type conveyor for conveying articles along a path of travel having frame structure, rail structure supported on the frame structure, and lift bar structure which is cyclically displaceable toward and away from the rail structure, said rail and lift bar structures being constructed and arranged in substantial parallelism along the path of travel to cooperatively support conveyed articles along the path of travel and to convey them in such a manner that displacement of the lift bar structure toward the rail structure causes the articles to pivot about their points of support on the lift bar structure with the result that their points of support on the rail structure move forwardly along the path of travel and such that during displacement of the lift bar structure away from the rail structure the articles pivot about their points of support on the rail structure with the result that their points of support on the lift bar structure move forwardly along the path of travel, the improvement for mounting the lift bar structure on the frame structure which comprises support arm structure disposed generally parallel to the path of travel of the articles, mounting structure via which the support arm structure mounts on the frame structure and mounting structure via which the lift bar structure mounts on the support arm structure, and wherein the support arm structure comprises plural elements disposed in parallelism with each other, and the plural elements comprise resiliently yieldable elements which are normally flat in their free state but which flex from their normally flat condition during operation of the conveyor.

4,496,043

SUPPORTING ASSEMBLY FOR TROUGHING ROLLS OF CONVEYOR BELTS

Lawson C. Wooldridge, Stourbridge, England, assignor to Brockway Engineering Company Limited, United Kingdom

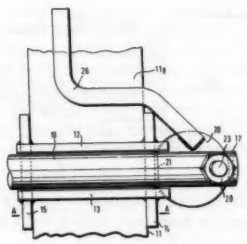
PCT No. PCT/GB82/00007, § 371 Date Aug. 27, 1982, § 102(e) Date Aug. 27, 1982, PCT Pub. No. WO82/02374, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 13, 1982, Ser. No. 414,375

Claims priority, application United Kingdom, Jan. 13, 1981, 8100963

Int. Cl.³ B65G *15/08*

U.S. Cl. 198—827 **4 Claims**



1. An idler roller assembly for supporting a conveyor belt in a trough formation and carried in a conveyor frame, said assembly including two outer rollers supported in said frame on shafts extending outwardly of said rollers, at least one of said shafts being supported in the said frame by a suppor means operable to move said idler roller assembly between an operative position in which said rollers support the conveyor belt and an inoperative position in which the said rollers do not support the conveyor belt, wherein said support means includes elements rigidly secured to the frame and in which the said one shaft is supported against lateral movement by said elements, whereby the said outer roller is positioned substantially normal to the conveyor line; said support means further including a disc member carried at the end of said one shaft for pivotal movement about an eccentric axis between a first position in which the said disc member maintains the said assembly in the operative position and a second position in which the assembly is in the inoperative position; said disc member cooperating with said frame and being provided with means which

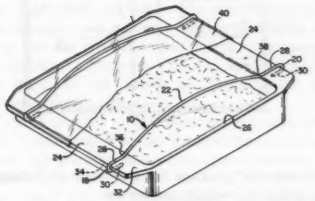
cooperates with a portion of said support means which is rigidly attached to said frame to resist rotation of said disc in said first position.

4,496,044

FLEXIBLE COVERING SUPPORT BRACKET

Charles M. Cummings, 156 Winthrop St., Watertown, N.Y. 13601

Filed Aug. 19, 1983, Ser. No. 524,672
Int. Cl.³ B65D *65/16*
U.S. Cl. 206—45.33 **21 Claims**



1. A support bracket for supporting a flexible sheet covering a container in spaced relation to the contents of the container, comprising:

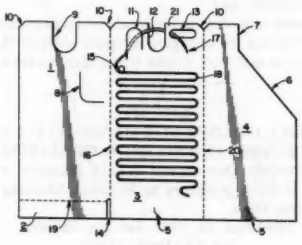
an elongated resilient member generally extending in a horizontal direction, having U-shaped end portions for removably engaging opposite top edges of the container, and an elongated, generally horizontally extending bowed upward portion between said U-shaped end portions for supporting thereabove the flexible sheet.

4,496,045

MULTI-PANEL FOLDER FOR SURGICAL SUTURES

Douglas M. Ferguson; William M. Owens; Michael Lang, and Jay P. Lincoln, all of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jun. 14, 1984, Ser. No. 620,605
Int. Cl.³ A61L *15/00*
U.S. Cl. 206—63.3 **18 Claims**



1. A folded elongated folder for a surgical suture comprising:

a first panel foldably connected to a second panel along a major edge thereof and a third panel foldably connected along a major edge to said second panel along the opposite major edge of said second panel;

said first panel having optionally chamfered upper corners, a generally U-shaped notch disposed in the center of the upper edge, means for locking said first panel to said third panel when folded, a fold line near the bottom of said first panel to form a foldable flap, and a clearance notch disposed at the lower corner of said first panel adjacent said second panel;

said second panel having optionally chamfered upper corners, a generally U-shaped notch disposed in the center of the upper edge, integral incised means for holding a needle in place disposed on each side adjacent said notch, an optional folder-loading registration aperture disposed below and to the left of said needle holding means adjacent the fold line connecting said first and second panels, and means for locking said second panel with said third panel;

said third panel optionally having a chamfered corner at the fold line between said third panel and the second panel, the major edge opposite said fold line having a contour to avoid overlapping the upper edge generally U-shaped notches of said first and second panels, and means for locking said third panel with said second panel;

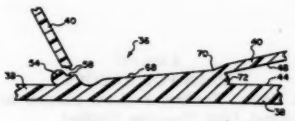
said folder when folded with said foldable flap disposed at the bottom of said first panel inwardly folded, said first panel folded to cover said second panel adapted to hold in place a surgical suture disposed thereon and to retain in place any needles attached thereto, said third panel folded to cover said first panel, and said third panel interlocked with said first and second panels at said interlocking means thereon to provide for the dispensing of said suture without opening said folder.

4,496,046

MULTIPLE CHAMBER CONTAINER WITH INNER DIAPHRAGM AND INTERMEDIATE CHAMBER

Albert Stone, Buffalo Grove; Edwin Pyde, Desplaines, and Peter Carveth, Glen Ellyn, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 532,428, Sep. 15, 1983,. This application Jun. 15, 1984, Ser. No. 619,648
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—219 **9 Claims**



1. A container having two chambers for the separate storage and selective mixing of two components, comprising:

(a) a first sheet including

(i) a first inner surface of a thermoplastic material, and

(ii) a first outer surface;

(b) a second, diaphragm sheet including

(i) a second inner surface of a thermoplastic material, said second inner surface having melt-flow characteristics substantially identical with the melt-flow characteristics of said first inner surface, and

(ii) a second outer surface;

(c) said second, diaphragm sheet sealed about at least a portion of its periphery to said first sheet and to a third sheet opposite said first sheet;

(d) said first sheet and said third sheet sealed about their entire peripheries, forming the exterior wall of said container;

(e) an externally, selectively, manually openable seal line between said first and said second, diaphragm sheets, said openable seal line extending across the width of said container, wherein a cross section taken through said seal line, perpendicular to said seal line at the cross section defines a seal, said seal formed by applied pressure and a focused energy source, which melts said first and second inner surfaces at said seal, said seal defining

(i) a bead area of increased thickness at a break end of said seal, between said first and second inner surfaces, said bead area of increased thickness coextensive with said first and second inner surfaces along less than all of the surface of said bead area,

(ii) a break line inwardly of said break end, between said second, diaphragm sheet and said bead area of increased thickness, the thickness of said seal at said break line being at the least not substantially less than the thickness of said second sheet, and

(iii) an arcuate depression having a concave downward surface extending from substantially adjacent said break line to a minimum seal thickness point;

(f) a permanent line of securement between said second and third sheets extending substantially parallel to and the length of said openable seal line;

(g) at least said second, diaphragm sheet, said openable seal line, said permanent line of securement and said third sheet defining a first chamber for holding the first component;

(h) at least said first sheet, said openable seal line, said permanent line of securement and said second, diaphragm sheet defining a second chamber for holding the second component;

(i) barrier means secured to the exterior surface of the exterior wall of said container, at one of that portion of said third sheet which defines said first chamber and that portion of said first sheet which defines said second chamber;

(j) wherein said barrier means comprises a virtually absolute barrier to at least one of gas, liquid and light;

(k) whereby manual separation of said first and second sheets near said openable seal line will rupture said seal line and said second sheet, placing said first and second chambers in open communication.

4,496,047

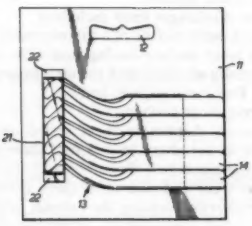
PACK FOR RAZORS

Derrick R. Gatley, Reading, England, assignor to Wilkinson Sword Limited, High Wycombe, England

Continuation of Ser. No. 357,361, Mar. 12, 1982,. This application Apr. 18, 1984, Ser. No. 601,114

Int. Cl.³ B65D *85/00, 73/00*

U.S. Cl. 206—354 **7 Claims**



1. A pack of razors comprising a card having an opening spaced from the sides of the card for the reception of a stack of razors each of which has a plane of symmetry, a head and a handle extending from said head, each handle having a slot therein extending along said handle from the outer end thereof, a said stack of said razors disposed within the opening such that the plane of symmetry of each razor lies substantially in the plane of the card and the card has a portion thereof along the margin of said opening which portion extends into said slot in the handle of each razor at the outer end thereof, and means for holding the heads of the razors to the card.

4,496,048

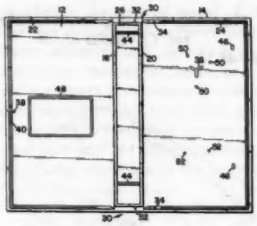
VIDEO CASSETTE CARRIER

Philip K. Sykes, Maple Grove, Minn., assignor to Blackbourn, Inc., Eden Prairie, Minn.

Filed Dec. 13, 1982, Ser. No. 448,954

Int. Cl.³ B65D *85/67, 85/672*

U.S. Cl. 206—387 **11 Claims**



11. An album type package for a cassette including at least one tape reel therein, which comprises:

an elongate spine having inside and outside surfaces;

first and second covers connected to opposite edges of said spine being pivotal between open and closed positions relative to said spine, said covers each having inside and outside surfaces with complementary flanges on the inside surfaces for defining a peripheral wall when said covers are closed;

rectangular boot means secured to the inside surfaces of said spine for receiving the cassette in edge-wise relationship therein and substantially constraining the cassette against longitudinal and lateral movement relative to said spine;

rib and detent means releasably securing said second cover to said boot means in a closed position;

means mounted on said second cover for constraining the cassette against movement out of said boot means when said second cover is closed;

means positioned within said boot means for longitudinally locating a relatively smaller cassette for engagement with said constraining means;

press-type latch means releasably securing said first cover to said second cover in a closed position so that the package is fully closed; and

spacer means mounted on the inside surfaces of said first and second covers for engaging opposite sides of the cassette received in said boot means when said covers are closed.

4,496,049

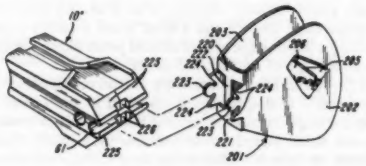
LABEL ROLL HOLDER FOR HAND-HELD LABELER, HOLDER BLANK, AND METHOD OF MAKING SAME

Robert M. Pabodie, Dayton, and Paul H. Hamisch, Jr., Franklin, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 13, 1983, Ser. No. 484,403

Int. Cl.³ B65C *11/00*

U.S. Cl. 206—395 **19 Claims**



2. Method of making a labeler, comprising the steps of:

providing a hand-held labeler having means defining a pathway for a carrier web having a series of pressure sensitive labels adhered thereto, means for delaminating labels from the carrier web, means adjacent the delaminating means for applying labels, means for advancing the carrier web, means for receiving a projection, and means defining a recess cooperable with a detent; cutting out of a sheet a label roll holder member having a side portion, a mounting member hingedly connected to the side portion by a hinge, and cuts defining a projection and a detent whereby the holder member is adapted to be releasably attached to a labeler; folding the mounting member at an angle with respect to the side portion so that the mounting member can mount a label roll; folding the mounting member at an angle with respect to the side portion so that the mounting member can mount a label roll; folding the holder member so that the projection and detent can engage a labeler; and connecting the projection of the holder member to the receiving means of the labeler and bringing the detent into cooperation with the recess.

19. A holder adapted to be connected to a hand-held labeler, the holder comprising: a holder member having a pair of laterally spaced side portions and a connecting portion, the holder member having means disposed between the side portions for mounting a label roll, the holder having means for connecting the holder to a labeler, the connecting means including a pair of laterally spaced first projections adapted to be received in a slot in the labeler and laterally spaced pairs of second and third projections, each pair of second and third projections straddling a said first projection, and the pairs of second and third projections being adapted to contact the labeler and stabilize the holder.

4,496,050

CASE FOR HOLDING FLAT ARTICLES

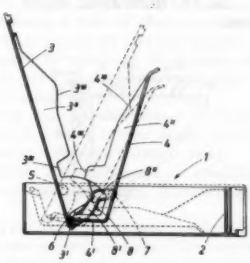
Balthasar Kirchner, and Schleicher Siegfried, both of Eferding, Austria, assignors to Ernst Stadelmann Gesellschaft m.b.H., Eferding, Austria

Filed Dec. 9, 1983, Ser. No. 559,800

Claims priority, application European Pat. Off., Jun. 24, 1983, 83890104.9

Int. Cl.³ B65D *43/16, 85/57*

U.S. Cl. 206—444 **3 Claims**



1. In a case for holding flat articles, comprising

a boxlike body,

a cover,

a first hinge connecting said cover to said body on a first hinge axis, said cover having a rear edge, which is parallel to and disposed adjacent to said first hinge axis, said first hinge axis being spaced from said rear edge by a distance which is approximately as large as the height of said body so that said box is adapted to be opened by an upward movement of said cover about said first hinge axis,

a lid, which is disposed on the inside of said cover and defines a compartment with said cover and is movable relative to said cover to a position in which said compartment is closed, and

a second hinge, which is disposed at said rear edge and connects said lid to said cover on an axis which is parallel to said first hinge axis,

the improvement residing in that

said body is provided with two cam tracks, which are spaced apart along said axes and face opposite sides of said lid,

each of said cam tracks has a circular portion, which corresponds to an arc of a circle that is centered on said first hinge axis, and a cam track end portion, which succeeds said circular portion in the direction of said upward movement and deviates outwardly from said circle, and

said lid is provided with two cam follower pins, which protrude from said lid in mutually opposite lateral directions and each of which cooperates with one of said cam tracks.

4,496,051

CONTAINER WITH INFORMATION-CARRYING ELEMENT

Georg J. Ortner, Thome Strasse 14, D-3300 Braunschweig, Fed. Rep. of Germany

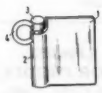
PCT No. PCT/EP82/00106, § 371 Date Jan. 28, 1983, § 102(e) Date Jan. 28, 1983, PCT Pub. No. WO82/04428, PCT Pub. Date Dec. 23, 1982

PCT Filed May 19, 1982, Ser. No. 464,509

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1981, 3122775; Apr. 23, 1982, 3215221

Int. Cl.³ B65D *23/00, 51/24;* **G09F** *3/04*

U.S. Cl. 206—459 **11 Claims**

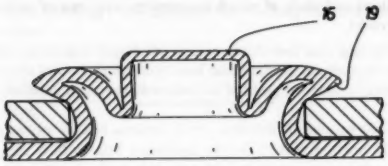


1. A combination including a vertically oriented container with a product dispensing opening therein, the container being of a size too limited to carry sufficient advertisement and/or other information relative to the product within the container, and further including as part of the combination an information tab with advertising and/or other information thereon and having a surface area substantially larger than the surface area of the container, said information tab extending laterally from the container outer surface and having a vertical extent at least equal to that of the container, stopper means for closing the container dispensing opening for preventing dispensing of the container product when the stopper means is applied to the container to close the opening, and holder means for said information tab, said holder means effectively inseparably connecting the information tab to the container, said container, said information tab, said stopper means and said holder means comprising an injection molded one piece product unit which, on attempted separation of the information tag from the container, is destroyed.

4,496,052
BLISTER PACKAGE WITH MEANS FOR SECURING BLISTER

Inge Nertman, Kungälv, Sweden, assignor to AB Volvo, Goteborg, Sweden

PCT No. PCT/SE82/00236, § 371 Date Feb. 22, 1983, § 102(e) Date Feb. 22, 1983, PCT Pub. No. WO83/00133, PCT Pub. Date Jan. 20, 1983
PCT Filed Jul. 5, 1982, Ser. No. 474,593
Claims priority, application Sweden, Jul. 6, 1981, 8104179
Int. Cl.³ B65D 73/00
U.S. Cl. 206—470 1 Claim

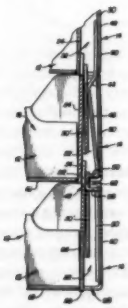


1. Means for securing a first part, of plastic material, such as a blister package, to a second part, such as a sheet of cardboard, said securing means comprising: at least one projection to be passed through a hole in the second part, each projection having an inner tubular portion to be located in the respective hole, and an outer portion, said outer portion having a first tubular portion connected to said inner tubular portion, a second tubular portion of a diameter smaller than said first tubular portion, an annular shoulder portion interconnecting said first and second tubular portions, and a vaulted termination portion connected to said second tubular portion and closing said projection; said projection being adapted to occupy a first position in which said first and second tubular portions project outwardly beyond the respective hole, and a second position in which said second tubular portion is snapped inside said shoulder portion and at least partly inside said first tubular portion and in which said first tubular portion is widened radially outwardly beyond the width of and outside the hole, whereby said projection forms a rivet locking said first part to said second part.

4,496,053
STACKING WIRE FOR PRODUCE CONTAINERS

Walton B. Crane, Sherman Oaks, Calif., assignor to Industrial Designs & Services, Oxnard, Calif.

Filed Sep. 29, 1982, Ser. No. 427,557
Int. Cl.³ B65D 5/46
U.S. Cl. 206—510 20 Claims



1. A stacking wire for use in stacking produce containers or the like having a double-layer end wall defining a vertically open slot for receiving the stacking wire, comprising:

a handle portion including a cross piece having a length generally corresponding with the transverse width of the end wall slot;

a pair of first spacers joined to opposite ends of said handle portion and extending in a direction generally perpendicular with respect to said cross piece for a distance generally corresponding with the thickness of the end wall slot;

a pair of legs joined respectively to said first spacers and extending generally downwardly therefrom; and

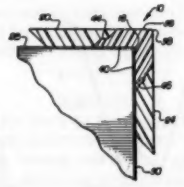
a pair of feet joined respectively to the lower ends of said legs, each of said feet including an intermediate spacer extending from the lower end of the associated leg in a direction generally perpendicular to said cross piece for a distance generally corresponding with the thickness of the end wall slot, a relatively short riser extending generally downwardly from said intermediate spacer, a wing projecting laterally outwardly from the lower end of said riser, and a second spacer extending generally perpendicular with respect to said cross piece for a distance generally corresponding with the thickness of the end wall slot and being joined generally to the laterally outer end of said wing;

said wing and second spacer of said feet being receivable into the upper extent of an end wall slot in a first container to maintain the end wall layers thereof in a predetermined spacing, said intermediate spacers of said feet being receivable into the lower extent of an end wall slot in a second container stacked onto said first container to maintain the end wall layers of said second container in said predetermined spacing and in vertical alignment with the end wall layers of said first container, said first spacers being thereupon positioned to maintain the upper extent of the second container end wall layers at said predetermined spacing, said cross piece being receivable into the lower extent of the end wall slot in a third container stacked onto said second container.

4,496,054
CORNER PROTECTOR FOR CONTAINERIZED ARTICLE

Harry M. Koltun, Palos Verdes Estates, Calif., assignor to Arrow Container & Packaging Corp., Pico Rivera, Calif.

Filed Apr. 18, 1984, Ser. No. 601,724
Int. Cl.³ B65D 81/02, 85/30
U.S. Cl. 206—586 6 Claims



1. A protector which substantially forms a hollow base tetrahedron for covering a corner of a box-like article, said protector comprising:

a hollow base shell having three walls joined to form a truncated portion of the tetrahedron, said shell including an aperture near an apex of the tetrahedron opposite the base, the portion of said shell forming said aperture also forming a retaining sleeve; and

a plug which cooperates with said shell when inserted through said aperture to provide an apex section for the hollow base tetrahedron, said plug including sidewalls which cooperate with said retaining sleeve to hold and position said plug within said aperture, and a bottom surface forming a tetrahedral cavity in connection with an undersurface of said shell, said bottom surface and said

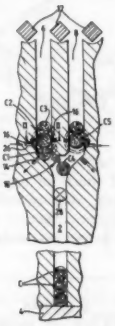
undersurface covering a portion of three perpendicular surfaces of the article adjacent the protected corner.

4,496,055

APPARATUS FOR FORMING GROUPS OF CIGARETTES

Robert J. Green, and Dennis Hinchcliffe, both of London, England, assignors to Molins PLC, London, England

Filed Sep. 28, 1982, Ser. No. 425,365
Int. Cl.³ A24C *5/48*; B07C *5/00, 5/342*
U.S. Cl. 209—536 **9 Claims**



1. Apparatus for continuously forming groups of cigarettes, wherein each group has the same predetermined number of cigarettes arranged in the same predetermined number of rows, from a plurality of streams of cigarettes from which defective cigarettes are rejected, said apparatus comprising:

(a) means defining a plurality of downwardly directed passageways each for containing a column of horizontally disposed cigarettes, the number of said passageways corresponding to the number of cigarettes in the longest row of each group;

(b) pusher means for ejecting cigarettes at the bottom of said plurality of passageways in a direction transverse to said passageway to form said groups of cigarettes;

(c) a cigarette hopper mounted above said passageways;

(d) means defining a pair of channels extending between each of said passageways and said hopper, each channel being adapted for receiving horizontally disposed cigarettes from said hopper and having an exit leading to the associated passageway;

(e) escapement means at said exits of each pair of channels adapted to alternately release single cigarettes from said pair of channels through alternate exits;

(f) testing means in each channel for checking at least one end of each cigarette passing therethrough for a defect; and

(g) rejection means in each channel connected to said testing means in the respective channel, for rejecting cigarettes having at least one defective end from said channel in a direction transverse to said channel.

4,496,056

AUTOMATED INSPECTION SYSTEM

Frederick C. Schoenig, Jr., Wilmington; Leonard N. Grossman, Wrightsville Beach, both of N.C.; Ching C. Lai, Pleasanton, Calif.; William Masaitis, Castle Hayne, and Robert O. Canada, Wilmington, both of N.C., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 25, 1982, Ser. No. 361,933
Int. Cl.³ B07C *5/02, 5/342*
U.S. Cl. 209—539 **7 Claims**

1. A system for inspecting a succession of discrete, substantially cylindrical pellets for conformance to predetermined criteria, including length and diameter, wherein said pellets are presented for inspection in a stack with said pellets disposed substantially coaxially and with the interfaces of said pellets in end-to-end abutment, said system comprising in combination;

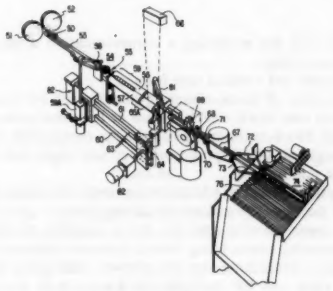
transport means for advancing said stack of said pellets along a path for presentation to an optical inspection station by spiraling around the stack axis at a controlled linear and angular velocity respectively;

said optical inspection station including means for illuminating an elongated inspection region of said path while said pellets travel within the limits of a stationary viewing region, said elongate portion of said path exceeding in length that of at least a single pellet;

a linear array of photosensitive elements, disposed in said stationary viewing region, each photosensitive element adapted to provide an output signal as a function of the intensity of light reflected thereto from said illuminated pellets; and

means for periodically scanning said output signals to derive a video signal from successive scans representative of selective characteristics of each pellet under inspection; and

a first preprocessing circuit, including:



means for extracting data from said video signal indicative of said conformance of the pellet under inspection to said predetermined criteria;

means for compressing said extracted data to collapse the rate at which preprocessed data is provided for further data processing;

means for normalizing said video signal to compensate for signal variations caused by factors extraneous to the inspection of said pellets for conformance to said criteria;

means responsive to said video signal for detecting each of said interfaces as a plurality of diminished video signal amplitudes each occurring at the same selective array position during a plurality of scans;

means responsive to said detecting means for generating a track gate by selecting signals corresponding to a group of successive array elements whose output signals correspond to illumination received from a single pellet; and

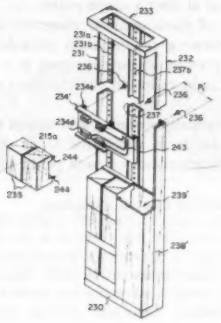
means responsive to the linear velocity of said single pellet for advancing said track gate;

whereby said track gate tracks the interfaces of said linearly moving single pellet and continuously brackets the signals corresponding to said pellet by means of leading and trailing track gate edges.

4,496,057
RACK STRUCTURE FOR MOUNTING A COMMUNICATION APPARATUS

Hideki Zenitani, Yokohama; Akira Oka, Tokyo; Itsuo Okamoto, Kawasaki; Hisao Hayashi, and Masajiro Taniguchi, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 15, 1983, Ser. No. 514,027
Claims priority, application Japan, Jul. 26, 1982, 57-128991; Jul. 27, 1982, 57-129642
Int. Cl.³ A47F 7/00
U.S. Cl. 211—26 **4 Claims**



1. A rack for mounting a communication apparatus, said rack comprising

right and left vertical side frames,

a plurality of block-mounting plates, each for mounting at least one block which houses at least one printed board, said block-mounting plates being rectangular and being longitudinally disposed between said right and left vertical side frames,

each said at least one block being mounted on the front face of the respective block-mounting plate,

the upper portion and the lower portion of said block-mounting plates being folded frontward so as to form an upper reinforcing rim and a lower reinforcing rim,

said right and left vertical side frames both having an L-shaped horizontal cross section, with folded edges of said L-shaped right and left vertical side frames being arranged inward so as to face each other, and

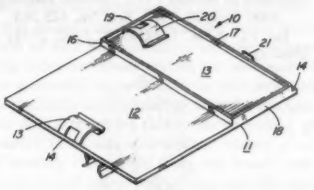
said block-mounting plates having securing members along the left edge and the right edge thereof, said securing members projecting backward and having an L-shaped horizontal cross section, with folded edges of said L-shaped securing members being arranged inward so as to face each other, the depth of said L-shaped securing members projecting behind said block-mounting plates being selectable in accordance with the depth of said at least one block to be mounted on the respective block-mounting plate, and said folded edges of said L-shaped securing members being secured to said folded edges of said L-shaped vertical side frames.

4,496,058
SHOPPING ORGANIZER

Garrett R. Harris, and Frances T. Harris, both of 4118 - 50 A St., Red Deer, Alberta, T4N 1Y9, Canada

Filed Jun. 1, 1983, Ser. No. 499,993
Int. Cl.³ A47F 5/00
U.S. Cl. 211—86 **14 Claims**

1. A shopper's helper assembly comprising: (a) a base; (b) an open bin disposed adjacent one portion of said base, said open bin including a clip located therein for releasably retaining a plurality of sheets of paper, said bin being spaced a predetermined close distance from one side edge of said base to provide a first flat surface, and a predetermined large distance from the other side edge, thereby providing a second, flat, paper-supporting surface; (c) a clip located along a side edge of said first flat surface for releasably holding a cylindrical writing instrument thereon, and a hole at the top of said first flat surface for selectively releasably supporting said cylindrical writing instrument therein; (d) a clip located at an edge of said second,

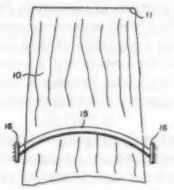


flat, paper-supporting surface for releasably retaining a pad of paper or a plurality of sheets of paper; and (e) at least one longitudinally extending, downwardly open, cross-section clamp secured to the undersurface of said base for releasably retaining said shopper's helper assembly on a complementarily-shaped support.

4,496,059
CURTAIN BOW

Raymond J. Leiter, 134 Long Meadow Dr., Rochester, N.Y. 14621

Filed Apr. 13, 1981, Ser. No. 253,613
Int. Cl.³ A47H 1/02
U.S. Cl. 211—105.1 **5 Claims**



1. Curtain bow apparatus for use to support a curtain hanging over an opening defined between two opposing vertical walls which comprises, a pair of end supports having front faces and back faces and adapted to be attached by the back faces each to a different one of said walls with said front faces opposing and opposite to each other, each of said end supports having a socket provided by a rectangular slot disposed at an acute angle to the vertical, said slots being directly opposite to each other, a bow of rectangular cross section similar to the shape of said slots and being of longitudinally uncompressible material flexible enough to be bowed and longer than the distance between said bottom of said sockets in said end supports, the opposite ends of said bow being received in said sockets to form a curved surface at said acute angle to the vertical for holding said curtain outward from the opening while being self-supporting in said sockets.

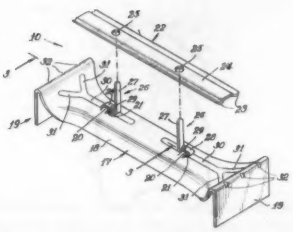
4,496,060
GARMENT HANGER SUPPORT FOR TRANSPORTABLE WARDROBE

William J. Anderson, and Wayne R. Anderson, both of Taylorsville, Miss., assignors to Enamel Products and Plating Co., McKeesport, Pa.

Filed May 27, 1982, Ser. No. 382,533
Int. Cl.³ A47F 5/00
U.S. Cl. 211—124 **7 Claims**

1. In a garment hanger support for use with a transportable

wardrobe of the type including a hanger bar having a downwardly opening main channel extending between support ends, a locking cap extending for substantially the full length of the main channel and adapted for overlying the main channel to secure hanger hooks therebetween, the improvement comprising at least one struck-up bracket integrally formed with the hanger bar along the main channel thereof and forming a slot, at least one hole extending through the locking cap in positional correspondence with said struck-up bracket, a hold down clip having a long arm and bracket engageable means at one end thereof, said bracket engageable means comprising a



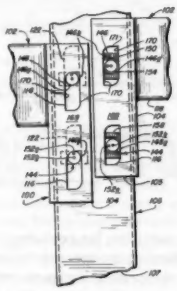
short arm rebent over the long arm and spaced apart therefrom to receive the bracket therebetween, said long arm being capable of passing through said bracket slot and said short arm having a length sufficient to overlap said struck-up bracket upon passage of said long arm through said bracket slot whereby to facilitate engagement with said bracket at said bracket engageable means, said long arm being bendable to extend upward for passage through said locking cap hole to be rebent over said locking cap to secure said locking cap to the hanger bar, said clip being a part separate and fully removable from said hanger bar and said locking cap, and said bracket engageable means being detachably engageable to said bracket.

4,496,061

CONNECTOR MEANS FOR SECURING SLOTTED MEMBERS

Charles E. Highsmith, Springfield, Tenn., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Oct. 9, 1980, Ser. No. 195,656
Int. Cl.³ B01D *23/24*
U.S. Cl. 211—191 **15 Claims**



1. A bolt and nut assembly for use in storage racks and other structures to secure a plurality of slotted members having a predetermined combined thickness, which bolt and nut assembly comprises:

(a) a generally T-shaped bolt, said bolt having a tee head and an elongated shank with threads thereon, said shank having a longitudinal axis and a terminal end located opposite said tee head, said bolt having a neck positioned between and connecting said shank and said tee head, said tee head having portions extending laterally outward from said neck for a predetermined total length and having a substantially smaller width,

the cross section of said neck normal to said longitudinal axis of the bolt shank having a maximum length measured in a first direction intersecting said shank axis, and a substantially smaller maximum width measured in a second direction intersecting said shank axis and normal to said first direction, the angle from the longitudinal axis of the tee head to said first direction being an acute angle when said angle is measured in the angular direction opposite to the direction of said shank thread,

the distance between the two planes parallel to the longitudinal axis of the tee head and tangent to said bolt neck cross section being substantially less than said predetermined tee head length; and

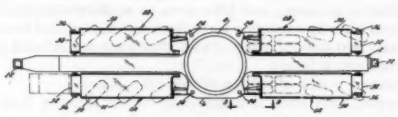
(b) an internally threaded nut, said nut being threadable on said threaded shank to a position in which the distance between said tee head and said nut, minus said predetermined combined thickness of said slotted members, is less than the length of said bolt neck, said nut in said position resisting further threading upon said shank except under application of a torque of at least a predetermined minimum magnitude greater than is applicable by manual twisting.

4,496,062

CRANE HAVING STABILIZING OUTRIGGERS

Narahari Gattu, and Joseph C. Terranova, III, both of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Mar. 7, 1983, Ser. No. 472,732
Int. Cl.³ B66C *23/62*
U.S. Cl. 212—189 **3 Claims**

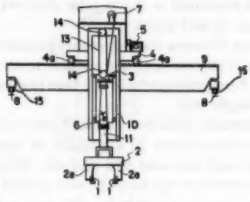


1. A crane having an elongated main frame and ground wheels located along the length of said frame on either side thereof for supporting said frame for travel along the ground; said main frame having a generally central portion, a revolvable upper mounted on said central portion, outriggers pivotably mounted to said main frame adjacent said central portion; means for pivotably mounting each of said outriggers to said main frame for swinging said outrigger between a radially extending, crane-stabilizing position and a transport position wherein said outriggers are located alongside said main frame and above said wheels; each of said outriggers being elongated and having a longitudinal axis and also having a major transverse axis and a minor transverse axis; power operated means for rotating said outriggers about their longitudinal axes whereby said major transverse axis of an outrigger assumes a horizontal position when said outrigger is stored alongside said main frame and above said wheels, and said major transverse axis assumes a vertical position when said outrigger is in said radially extending, crane-stabilizing position.

4,496,063
METHOD OF HANDLING SLABS BY AN OVERHEAD TRAVELING CRANE PROVIDED WITH A SLAB GRIP LIFTER

Sugao Ishii; Susumu Itou, both of Chiba; Mikio Kawamura, Ichihara, and Tadashi Tsukamoto, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Oct. 22, 1982, Ser. No. 436,058
Claims priority, application Japan, Oct. 27, 1981, 56-172597
Int. Cl.³ B66C *17/00, 17/06;* B65G *3/00, 9/04*
U.S. Cl. 212—270 1 Claim



1. A method for handling slabs with an overhead traveling crane which includes a device for gripping and lifting a slab, said device comprising a crab disposed on and movable along a movable girder of said crane, a crab moving means, a brake for said crab moving means, a rotatable vertically movable lifter, a lifter swinging means, a brake for said lifter swinging means, at least two laterally spaced apart lifter arms on said lifter, at least two laterally spaced apart pairs of pawls on said lifter arms, means for actuating said lifter arms and brakes for said lifter arm actuating means,

said method being especially adapted for lifting a slab which has a centerline angled relative to a centerline of said lifter or which has a centerline deviating from a centerline of said lifter, said method comprising the sequential steps of:

moving said crab and lifter into a position substantially above the slab to be gripped;

lowering said lifter onto the slab to be gripped;

actuating, with said brake for said lifter swinging means and said brake for said crab moving means disengaged, said lifter arms containing said two laterally spaced apart pairs of pawls with said lifter arm actuating means, so that two pawls contact said centerline angled or deviated slab and further actuating said lifter arms to adjust the position of said lifter by a reaction force from said slab so that both of said two pairs of pawls of said lifter arms contact said slab and grip it firmly;

detecting a lack of motion of said lifter arms;

stopping said lifter arm actuating means when a lack of motion of said lifter arms is detected;

engaging said brakes for said lifter arm actuating means so that said lifter can be raised for subsequent operations;

vertically moving said lifter with said slab; and

moving at least one of said crab and said girder to transfer said slab to a second position.

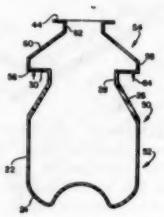
4,496,064
BLOW MOLDED CONTAINER AND METHOD OF FORMING THE SAME

Martin H. Beck, Brookline, and Suppayan M. Krishnakumar, Nashua, both of N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,162
Int. Cl.³ B65D *23/00;* B29C *17/12*
U.S. Cl. 215—1 C 13 Claims

1. An intermediate article of manufacture comprising a blow molded thermoplastic article, said article including a lower portion in the form of a container having a tubular body, an open mouth and a peripheral closure receiving portion, all of said container having a high degree of biaxial orientation with the degree of biaxial orientation of said peripheral closure receiving portion approaching that of said tubular body, and an upper portion in the form of an accommodation element terminating in an open neck portion having substantially no orientation, and said peripheral closure receiving portion being of an outline materially greater than that of said open neck portion

10. A method of forming a blow molded thermoplastic container of the type wherein all portions of said container have a high degree of biaxial orientation, said method comprising the steps of blow molding from a thermoplastic preform an

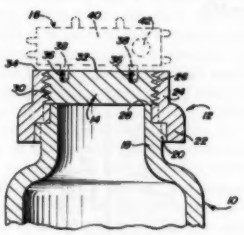


intermediate article of manufacture including a lower portion in the form of a container having a tubular body, an open mouth and a peripheral closure receiving portion, all of said container having a high degree of biaxial orientation with the degree of biaxial orientation of said peripheral closure receiving portion approaching that of said tubular body, and an upper portion in the form of an accommodation element terminating in an open neck portion having substantially no orientation, and said peripheral closure receiving portion being of an outline materially greater than that of said open neck portion, and severing said accommodation element from said container in an area having a high degree of biaxial orientation.

4,496,065
KEY OPERATED SECURITY CAP

David L. Nagy, 5114 N. Western Ave., Chicago, Ill. 60625

Filed Jan. 13, 1984, Ser. No. 570,453
Int. Cl.³ B65D *51/16*
U.S. Cl. 215—207 13 Claims



1. A security cap structure for containers such as medicine bottles and the like having an opening defined by a container neck, the structure comprising a cap member having a skirt portion for gripping around the neck of the container and a hollow cylindrical portion with an internal thread for projection above the rim of the container, a threaded plug for threading into the cylindrical portion of the cap member to a position such that an outer surface of the plug does not project substantially above the rim of the cylindrical portion, at least one key-receiving depression in an outer surface of the plug, and a key having a projection related to the key-receiving depression in the plug, whereby threading of the plug out of the cylindri-

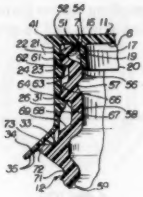
cal portion of the cap member from said position is dependent upon use of the key.

4,496,066

NECK FINISH FOR PLASTIC CONTAINERS

Joseph J. Bullock, III, Atherton, Calif., assignor to Three Sisters Ranch Enterprises PTRs, San Carlos, Calif.

Filed Jul. 27, 1983, Ser. No. 517,584
Int. Cl.³ B65D *41/18*
U.S. Cl. 215—320 **8 Claims**



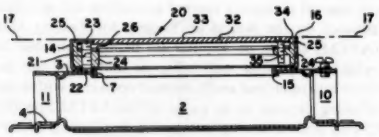
1. In combination, a neck for a container formed of a flexible plastic material comprising a straight, thin top flange extending inward from the upper end of said neck, said flange slanting upwardly at an acute angle of approximately 20° from the horizontal, first locking means on said neck below said flange, a cap having a disc, an inner and an outer skirt depending from said disc, second locking means on said outer skirt cooperable with said first locking means, whereby when said first and second locking means are engaged said flange is depressed and seals against the underside of said disc, said flange being dimensioned and positioned to slant upward-inward into the annular space between said skirts with the inner edge of said flange fitting tightly into the corner where the outside of said inner skirt intersects the underside of said disc.

4,496,067

UNDERFLOOR JUNCTION BOX

Richard D. Benscoter, Vienna, W. Va., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Mar. 28, 1984, Ser. No. 594,215
Int. Cl.³ H02Q *3/08*
U.S. Cl. 220—3.7 **4 Claims**



1. An underfloor system junction box with a panless access system for use with both floor carpet and floor tile comprising:

hollow housing means having a top opening and a plurality of side openings, the top opening providing for hand access to the interior of the housing and the side openings providing means for securing underfloor ducts to the box and the housing being adapted to be mounted in the floor with said top opening extending generally horizontally;

an annular plaster ring secured to said housing and extending around the periphery of said top opening for use in preventing entry of concrete to the interior of the housing during the pour;

a plurality of adjusting screws disposed inside of said plaster ring and each rotatably mounted on said housing and spaced around the periphery of said top opening and extending upwardly from the housing;

an adjusting ring disposed inside of said plaster ring and mounted on said adjusting screws and having an upwardly extending filler flange disposed adjacent the interior of the plaster ring, rotation of said adjusting screws causing the ring to move in a vertical direction;

annular gasket means mounted on said adjusting ring;

a plurality of support buttons each having a head section and a body section, the body section removably mounting the button on said adjusting ring with its head section engaging said gasket;

a cover disposed inside of said adjusting ring filler flange and engaging the head sections of said buttons with the top surface of the cover substantially flush with the top edge of said filler flange;

hold-down screw means removably securing said cover to head sections;

a plurality of openings in said cover providing access to said adjusting screws, the screws being adjusted to cause the cover and the top edge of the filler flange to be substantially flush with the top edge of the plaster ring and in said substantially flush condition the cover, the top edge of the filler flange, and the top edge of the plaster ring being adapted for use with floors employing a carpet surface with carpet on the cover and on the floor adjacent thereto; and

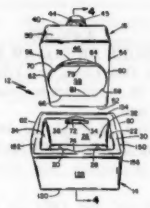
said components providing the option for said cover to be removed, said buttons to be removed, the cover replaced to engage said gasket means with the gasket means positioning the cover below the top edge of said filler flange a distance substantially equal to the thickness of the tile and then the adjusting ring adjusted upwardly so that the top portion of said filler flange is raised above the top edge of said plaster ring a distance substantially equal to the thickness of the tile and in said raised condition, the cover, the top section of the filler flange, and the top edge of the plaster ring being arranged for use in floors employing a tile surface wherein the top portion of the filler flange can function as a tile trim for tile on the cover and the floor adjacent thereto.

4,496,068

CONTAINER ASSEMBLY

Wilfred J. Blease, Greenville, N.H., assignor to Pioneer Plastics, Inc., Greenville, N.H.

Continuation of Ser. No. 164,580, Jun. 30, 1980, abandoned.
This application Feb. 13, 1984, Ser. No. 579,729
Int. Cl.³ B65D *21/02*; A47G *23/64*
U.S. Cl. 220—4 D **4 Claims**



1. A container assembly including a generally rectangular open top container and a cover adapted to be releaseably assembled and locked on top of said container by their relative rotation,

said container having generally rectangular inner and outer spaced parallel bottom walls, generally rectangular inner and outer spaced parallel end and side walls, and a generally rectangular planar peripheral top wall extending between said inner and outer end and side walls and defining a generally rectangular central top opening having a central axis of rotation perpendicular to the plane of said container peripheral top wall

said container inner side walls having integral aligning and locking means including

opposed arcuate recessed aligning surfaces of predetermined radius from said central axis of rotation extending outwardly into both said container inner side walls and said container top wall and extending downwardly from said container top wall, and

outwardly extending opposed arcuate locking grooves concentric with and of greater radius from said central axis of rotation than that of said recessed surfaces, said arcuate locking grooves extending outwardly into said container inner side walls, located below and parallel with said recessed aligning surfaces, and spaced downwardly from and parallel to the plane of said container peripheral top wall, and

said cover having a top wall and a bottom wall with a generally rectangular generally planar peripheral outer wall portion

said cover bottom wall having integral aligning and locking means extending downwardly therefrom generally centrally thereof including

generally arcuate aligning surface portions extending downwardly from said cover bottom wall, said aligning surface portions having a radius from said central axis of rotation slightly less than the radius of said recessed aligning surfaces for cooperating with said container recessed aligning surfaces to align said cover and container in their initial assembled position with said cover bottom wall and said container top wall in planar contact at a horizontal angle to one another

opposed outwardly extending arcuate locking flanges in a plane parallel to and spaced downwardly from said aligning surface portions, said locking flanges in the initial assembled position of said container and cover having a radius from said axis of rotation greater than that of said arcuate aligning surface portions and slightly less than that of said arcuate locking grooves and cooperating with said container opposed locking grooves for locking assembly of said cover and container upon unidirectional relative rotation of said cover and said container in the plane of said container peripheral top wall and said cover bottom wall from its initial assembled position to its locked position, and

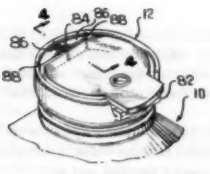
said container assembly having, in its assembled and locked position, the peripheral outer portion of said cover bottom wall in contact with said container peripheral top wall with the outer end and sides edges of said cover bottom wall generally contiguous with the outer end and side edges of said container peripheral top wall.

4,496,069

CLOSURE BREAK-AWAY TABS

Robert A. Winkless, Oak Lawn, and Edmund M. Kulesa, South Holland, both of Ill., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Nov. 23, 1983, Ser. No. 554,856
Int. Cl.³ B65D *51/16, 39/00*
U.S. Cl. 220—260 **5 Claims**



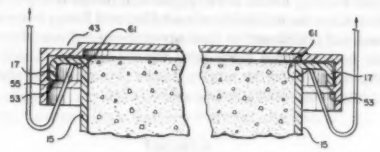
1. A closure for a container comprising a tubular neck member having a pour opening, a closure plug portion hingedly connected to said neck member by a first hinge and having a pour opening plug for closing said pour opening and a vent opening, and a venting portion hingedly connected to said closure plug portion by a second hinge and having a vent plug for closing said vent opening, said neck member having adjacent said pour opening an upstanding fulcrum post and said venting portion including a lever engageable with said fulcrum post to lift one end of said closure plug portion relative to said neck member and to initiate removal of said pour opening plug from said pour opening, said closure in its closed condition having said second hinge disposed adjacent said fulcrum post wherein a pry tool may be used to pry said closure plug portion relative to said neck member in a tampering action, said fulcrum post having weakening means formed therein for effecting distortion thereof by a pry tool to provide tamper-indicating means.

4,496,070

CONTAINER AND LID FORMING A DISPOSABLE MOLD

Samuel H. Lane, Jr., 1807 Cedar Elm Dr. W., Arlington, Tex. 76012

Continuation-in-part of Ser. No. 428,153, Sep. 29, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,760
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 **11 Claims**



1. A combination container and mold comprising:

a. a container bucket portion including a unitary plastic piece having a closed bottom end; a cylindrical, tubular wall extending substantially perpendicular to said bottom end and connected therewith and terminating in an open end; said cylindrical tubular wall being so nearly cylindrical that all diameters thereof are within Δd specifications allowed by the American Society for Testing Materials (ASTM) C-470; an annular lip being connected to said cylindrical tubular wall adjacent said open end to reinforce said open end and keep said open end within Δd inch of being circular so as to be within ASTM Specification C-470; and removing means for facilitating removal of said mold from the set test sample; said lip having an underside; said removing means being disposed longitudinally of said cylindrical, tubular wall and adapted to facilitate rending said wall for removal of said mold;

b. a locking, moisture-proof lid consisting essentially of a circular portion having a substantially flat top for extending across said open end of said bucket portion and having a downwardly depending skirt at its periphery for grippingly encompassing the outside periphery of said lip on said bucket; said skirt including a tapered shoulder means for being slid downwardly over said lip and snapping into conforming engagement with said underside of said lip; and

c. a carrying tong having a handle at least as long as the diameter of said bucket portion, downwardly depending bail sections at each end of said handle and connected therewith, and a carrying means for picking up and carrying said container bucket portion and lid and any sample of material therewithin.

4,496,071

PRESSURE VESSELS HAVING END CLOSURES AND RETAINERS

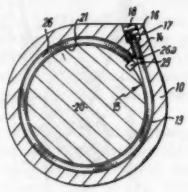
Duncan R. Stewart, Newent, England, assignor to Valve Conversions Limited, Gloucester, England

Filed Jul. 15, 1983, Ser. No. 514,083

Claims priority, application United Kingdom, Jul. 17, 1982, 8220796

Int. Cl.³ B65D *45/32*

U.S. Cl. 220—319 **9 Claims**



1. A pressure vessel comprising two members in telescopic relationship, the two members comprising a hollow member and an end closure, flexible continuous means extending around the end closure and located in cooperating grooves in the two members so as to operatively connect the end closure and the hollow member for resisting separating movment therebetween, a passage in one of said two members and extending from the said groove in the one member to the exterior of said one member for insertion and withdrawal of the continuous means, a removable plug closing said passage for resisting removal of the continuous means and for sealing the passage from the exterior, and annular seals between the hollow member and the end closure on both sides of the continuous means.

4,496,072

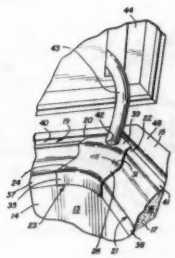
INSULATED CABINET COLLAR CORNER ELEMENT

George J. Fleck, Arnegard, N. Dak., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 29, 1982, Ser. No. 428,414

Int. Cl.³ F25D *23/08*; B65D *88/74*

U.S. Cl. 220—432 **16 Claims**



1. In a cabinet structure having an upstanding sidewall defining a vertical corner, said wall comprising an inner liner, an outer shell defining with said liner an intermediate insulation space, foamed-in-place insulation in said space, a first breaker collar extending between said shell and liner over said space and having an end adjacent one side of said corner, and a second breaker collar extending between said shell and liner over said space and having an end adjacent the other side of said corner, said cabinet structure further defining a closure and torsion bar hinge means for removably mounting said closure to said sidewall comprising a connector element extending from said closure downwardly into said insulation space at said corner, the improvement comprising

a collar corner element extending between said shell and liner over said space at said corner, said corner element having

edge portions overlying said breaker collar ends,

flange means underlying at least one of said breaker collar ends for retaining the corner element in association with said breaker collar ends, and

locking means extending downwardly on said corner element into said insulation space and embedded in said foamed-in-place insulation to lock the corner element effectively in the cabinet structure, said corner element further defining a through opening through which said connector element extends.

4,496,073

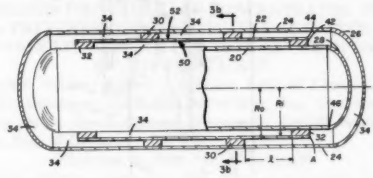
CRYOGENIC TANK SUPPORT SYSTEM

David M. Silver, Bethesda, and Newman Dehaas, Silver Spring, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 24, 1983, Ser. No. 469,451

Int. Cl.³ F17C *1/12*

U.S. Cl. 220—445 **18 Claims**



1. A support system for an internal mass at a first temperature comprising:

an internal mass;

a support tube with a longitudinal axis and a cross sectional area, surrounding the internal mass and attached thereto via a first area of contact;

an external shell at a second temperature enclosing the support tube and attached thereto via a second area of contact which is positioned a predetermined distance along the support tube axis from the first area of contact such that a substantial temperature gradient exist through the support tube area between first and second areas of contact;

wherein the support tube is dimensioned such that beam dynamics apply thereto; and the support system is a single-stage system dimensioned to not have a natural frequency below a predetermined frequency.

4,496,074

NEWSPAPER VENDING MACHINE

Walter K. Owens, Florala, Ala., assignor to Mfg. Design, Inc., Florala, Ala.

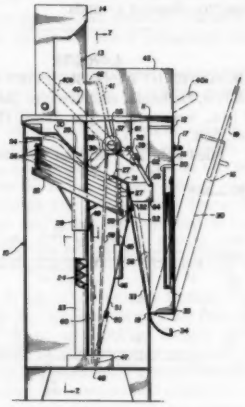
Filed Aug. 12, 1982, Ser. No. 407,329

Int. Cl.³ B65G *59/02*; G07F *11/24*

U.S. Cl. 221—39 **10 Claims**

1. In a newspaper and magazine vending machine, a cabinet body portion, a conventional coin mechanism on the cabinet body portion, fixed vertical guide posts in the cabinet body portion, a vertically movable inclined tray for a stack of newspapers having their folded edges arranged forwardmost on the tray, yielding means biasing the tray and stack of newspapers upwardly, a fixed abutment in the cabinet body portion bearing on the unfolded edge portion of each topmost newspaper in the stack, a hold-down plate in the cabinet body portion overlying and pressing downwardly on the folded edge portion of each topmost newspaper in the stack, yielding means constantly biasing the hold-down plate downwardly relative to the stack

of newspapers and said tray, an inclined single newspaper delivery chute at the front of the cabinet body portion from which a customer can receive a single newspaper and being disposed at the forward end of said hold-down plate, a transverse horizontal axis rocker shaft journaled on the cabinet body portion above the hold-down plate and said tray, a dispensing lever secured to the rocker shaft exteriorly of the cabinet body portion and adapted to be pulled forwardly by a customer to a single newspaper dispensing position following insertion of proper coins into said coin mechanism, a control element on the rocker shaft within the cabinet body portion adapted to engage a releasable locking element of the coin mechanism, free wheeling sprocket gears on the rocker shaft in the cabinet body portion, sprocket chains engaged with said



sprocket gears and descending therefrom and engaging guides near the bottom of the cabinet body portion and then ascending and being connected with a part of said tray, drivers for said sprocket chains on the rocker shaft and turning therewith so that the chains are driven in one direction when said dispensing lever is pulled to the single newspaper dispensing position to thereby momentarily relieve the tray from its upward biasing force, and a newspaper release roller carried by the rocker shaft in eccentric relation thereto and being movable by the rocker shaft into pressure contact with each topmost newspaper so as to distort the same and thus effect withdrawal of its folded forward edge from beneath said hold-down plate, whereby such withdrawn newspaper can then gravitate with the assistance of said roller during its return stroke into said delivery chute.

4,496,075

ROTARY METERING AND DISPENSING APPARATUS

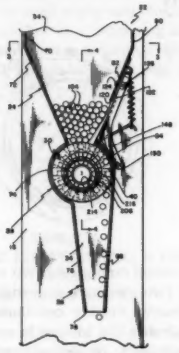
Frank L. Ray, Rte. #2, Winfield, Kans. 67156

Continuation-in-part of Ser. No. 178,135, Aug. 14, 1980, Pat. No. 4,444,130. This application Sep. 30, 1982, Ser. No. 431,347

Int. Cl.³ G01F *11/14*

U.S. Cl. 221—235 **10 Claims**

1. For use in metering and dispensing apparatus, a circular cylindrical sleeve having a central horizontal axis and being adapted for rotation about its axis, said sleeve having a substantial wall thickness and being provided with a plurality of circumferentially and equiangularly spaced radial openings therethrough that lie in a common plane perpendicular to the axis of the sleeve, each of said openings being provided with a plunger that extends thereinto from within the sleeve with a free radial movement therein that is limited in extent to an amount less than the wall thickness of the sleeve between a radially extended position and a radially retracted position, with such plunger substantially obstructing the opening radially throughout its movement between said extended and retracted positions, and a common gravity actuated means disposed within the sleeve for rotation therewith that is operatively connected to all the plungers for operation in response to rotation of the sleeve to cyclically urge radial reciprocation of each of the plungers in such phased relation that the plungers associated with uppermost openings in the sleeve are radially retracted and those associated with lowermost openings in the sleeve are radially extended, whereby the radially outermost unobstructed volumes of the uppermost openings are maximized



and those of the lowermost openings are minimized, said gravity actuated means having a generally cylindrical overall configuration and having a central axis with said plungers extending radially outward therefrom, and means loosely connecting each of the plungers to the gravity actuated means that enables each plunger a limited degree of angular freedom about a direction that is normal to the axis of said gravity actuated means.

4,496,076

MULTIPLE BLAST AERATOR SYSTEM

L. Kirk Tompkins, Little Rock, Ark., assignor to Global Manufacturing Co. Inc., Little Rock, Ark.

Filed Apr. 16, 1982, Ser. No. 369,100

Int. Cl.³ B65D *88/72*

U.S. Cl. 222—3 **7 Claims**

1. A multiple blast aerator hopper system comprising:

a generally upright, rigid storage bin having walls, an outlet and an inlet;

a plurality of blast aerators mounted on said bin at radially spaced-apart intervals about the periphery thereof, each aerator comprising:

a generally cylindrical, rigid tank having an axis, and a front end fitted with a blast discharge opening coaxially aligned with respect to said axis;

a rigid, elongated, tubular, blast discharge pipe adapted to be coaxially secured and aligned within said tank, said pipe having a front output end, a rear end positioned interiorly of said tank, a counter-bored, internal front

shoulder seat, and a predetermined intermediate internal diameter;

a piston seat assembly coaxially positioned within said blast discharge pipe in abutting relation with respect to said internal shoulder, said seat assembly including a rear, chamfered seat;

a resilient, generally cylindrical, dual diameter piston coaxially disposed within said blast discharge pipe and axially displaceable between an aerator tank fill position and an aerator tank exhaust position; a main body portion of said piston having a diameter substantially equal to said blast output pipe predetermined intermediate diameter and a front portion of said piston having a diameter less than said discharge pipe intermediate diameter and terminating in a front, chamfered portion adapted to matingly engage said piston seat assembly chamfered seat when said piston assumes said aerator fill position;

vent means defined in said blast discharge pipe for outputting air temporarily stored within said tank through said blast discharge pipe front output end in response to movement of said piston to said aerator tank exhaust position;

end cap means adapted to be coaxially, sealingly coupled to said blast discharge pipe rear end for limiting rearward axial displacement of said piston, the end cap means operable to define a sealed cavity between it and said piston at the rear of said blast discharge pipe; and,

valve control means in fluid flow communication with said cavity for filling said cavity and thus said tank and for subsequently initiating an output blast by venting said cavity;

the first of said blast aerators mounted closest to said storage bin outlet, and each successive blast aerator being mounted higher than the previous blast aerator; and,

timing means for initiating a timed sequence of air blasts by firing said blast aerators in a predetermined operational sequence.

4,496,077

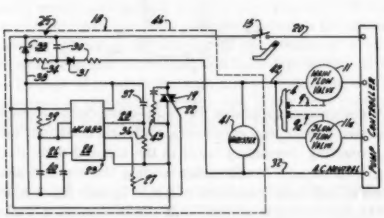
LEAK DETECTOR MONITOR FOR PRESSURIZED FLOW SYSTEMS

James J. Zuehlsdorf, Sussex, Wis., assignor to Uni-Pump, Inc., Menomonee Falls, Wis.

Filed Mar. 3, 1983, Ser. No. 471,653

Int. Cl.³ B67D *5/32*

U.S. Cl. 222—61 **11 Claims**



1. A fluid flow system having a pump means for withdrawing of fluid from a storage tank and supplying such fluid through a main distribution line to at least one individual dispenser under pressure and wherein said supply line pressure can vary over a range between a low pressure in the presence of a leak in the system and a significantly higher delivery pressure in the absence of said leaks and wherein said supply line pressure is subject to variations upon initial operation of said pump means simulating a leak condition, leak detector valve means connected to said supply line and responsive to the differential pressure between the supply line pressure and the delivery pressure from said storage tank to prevent free flow from the storage tank to the supply line, the improvement in a leak detector monitor comprising an individual flow control means having an electrical operator one each for each of said dispensers, a control switch means operable to provide power to said pump means and to said individual flow control means within the corresponding dispenser, each of said dispensers including an interlock means including an interlock switch connected in series between said control switch means and said individual flow control means to prevent operation of said flow control means during the initial operation of said pump means, and timing means connected in circuit through said control switch means and having an output connected to said interlock switch means, said timing means being responsive to closing of said control switch means to generate a turn-on signal to said interlock switch means only a predetermined time after the closing of said control switch means.

4,496,078

CONTAINER, ESPECIALLY A DISPOSABLE CONTAINER FOR BEVERAGE CONCENTRATES, WITH A PREFERABLY MAGNETICALLY-ACTUATED REUSABLE MEASURER ATTACHED TO THE OPENING OF THE CONTAINER

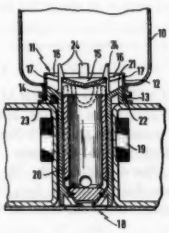
Hartmann Nelzow; Färber Karlheinz, both of Giengen, and Anton Deininger, Bachhagel, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,639

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033874

Int. Cl.³ B67B *7/24*

U.S. Cl. 222—87 **9 Claims**



1. Container mounting and metered dispensing assembly for beverage concentrates, comprising a container having an opening formed therein, a seal including a carrier disposed in said opening and a sealing membrane also disposed in said opening and, together with said carrier, sealing said opening of said container, a reusable measuring device disposed coaxially with said carrier and having an end section for attachment to said container at said opening, at least one tab projecting from said end section for punching through said seal, and at least one barbed hook disposed on said at least one tab and being solidly snappable onto said carrier when attaching said measuring device to said container at said opening, said measuring device being detachable from said container, after being attached to said container, exclusively by destructively ripping said carrier from said opening, said seal having a rim formed thereon, said barbed hook having a notch formed therein, and said carrier being in the shape of a star having a centrally-disposed solid plate snappable into said notch and having ridges extending substantially radially from said plate to said rim.

4,496,079

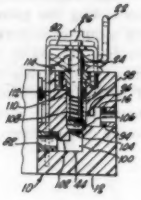
COMBINATION LOCK FOR MULTIPLE FAUCETS

Donald Verley, Valencia, Calif., assignor to McCann's Engineering and Manufacturing Company, Los Angeles, Calif.

Filed Jan. 15, 1982, Ser. No. 339,769

Int. Cl.³ B67D 5/56

U.S. Cl. 222—129.1 **8 Claims**



1. A lock assembly for rigidly attaching a nozzle assembly to a fluid source having a storage supply line, the lock assembly having a housing and a fluid supply line and a fluid output line with a lock assembly channel connecting the fluid supply line to the fluid output line, a nozzle assembly having a nozzle channel and a pole receivable into the housing to accommodate alignment of the nozzle channel with the fluid output line, the lock assembly further comprising:

a movable piston positioned within the lock assembly channel and biased into a position to close the lock assembly channel;

a locking element, said locking element connected to said piston, said locking element having a portion selectively adapted to engage the pole and retain the pole within the housing;

a movable arm pivotably attached to said locking element, said arm adapted to simultaneously cause engagement of said locking element portion with the pole to rigidly attach the housing to the nozzle assembly and to cause movement of said piston to open the lock assembly channel.

4,496,080

AUTOMATIC HOUSEHOLD BEVERAGE DISPENSER

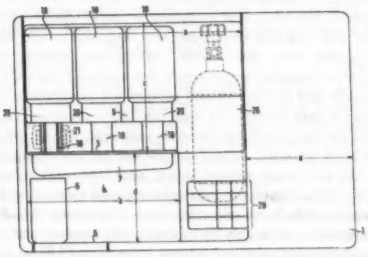
Karlheinz Farber, and Hartmann Nelzow, both of Giengen, Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeraete GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 468,804, Feb. 28, 1983, abandoned. This application Jul. 28, 1983, Ser. No. 517,928

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 7930729[U]

Int. Cl.³ B67D 5/56

U.S. Cl. 222—129.3 **6 Claims**



1. Automatic household beverage dispenser, comprising an equipment cabinet having a front, a mixing chamber formed in said cabinet, an equipment chamber formed in said cabinet, a wall separating a portion of said equipment chamber from the remainder of said cabinet including said mixing chamber, said mixing chamber having a dispensing station disposed therein and said mixing chamber having electrical and flow means disposed therein separate from said wall for proportionate dispensing of concentrate, for forming a mixture of concentrate and water and for conducting the mixture to said dispensing station, said portion of said equipment chamber having detachable and replaceable functional parts disposed together therein including supply tanks for beverage concentrate and means for dispensing carbon dioxide, and said equipment chamber having a coverable opening formed at said front of said equipment cabinet for removal and replacement of all of said functional parts disposed therein, said equipment chamber formed in said equipment cabinet being subdivided into one chamber at said front of said equipment cabinet being open toward said opening for said supply tanks and carbon dioxide dispensing means, and at least one other chamber being disposed behind said one chamber and open toward said opening for functional parts requiring routine servicing.

4,496,081

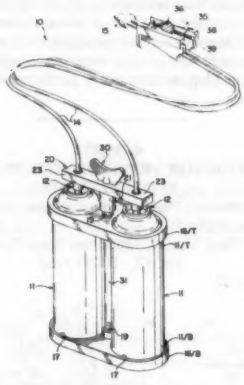
DISPENSING APPARATUS

Merlyn F. Farrey, Akron, Ohio, assignor to Fomo Products, Inc., Akron, Ohio

Filed Jul. 8, 1983, Ser. No. 512,029

Int. Cl.³ B67D 5/60

U.S. Cl. 222—135 **4 Claims**

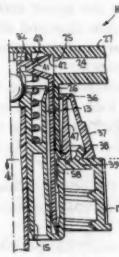


1. A dispensing apparatus for multi-component foam reactants in two pressurized containers, each said container including a projecting dispensing valve in the top end thereof, comprising: two parallel brackets for holding the top end and the base end of said two containers in a side-by-side fixed position, each bracket having a medial bore therethrough; a T-shaped member having a projecting medial sleeve with a bore therethrough and laterally extending rigid side bars for engagement with said container valves; a length of flexible tubing connected to each of said container valves and extending from one of said rigid side bars to a dispensing nozzle; a manual means for controlling the flow of foam reactants through said lengths of flexible tubing when said container valves are open; a manual key having an elongated shank extending coaxially within said bracket medial bores and said T-shaped member sleeve bore; and thread means having an internal component on said key shank and an external component in one of said bores whereby manual rotation of said key will move said T-shaped member toward one of said brackets to open said container valves in unison.

4,496,082
LIQUID DISPENSING PUMP

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Continuation-in-part of Ser. No. 332,338, Dec. 18, 1981, Pat. No. 4,410,107. This application Feb. 23, 1983, Ser. No. 469,118
Int. Cl.³ B67D 5/32
U.S. Cl. 222—153 9 Claims



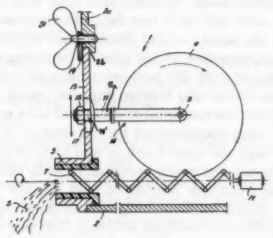
1. A dispensing pump comprising, a pump body capable of being mounted on a container of product to be dispensed, a stationary piston having a valve-controlled inlet mounted on said pump body, finger actuacted plunger means mounted on said piston for sliding reciprocating engagement and forming a variable volume pump chamber therewith, said plunger means having a valve-controlled discharge passage, a return spring acting between said piston and said plunger means for urging said plunger means into a fully raised position above said body, a control ring rotatably mounted on said pump body and having means engaging said plunger means for limiting same in said fully raised position and having means for locking said plunger means at least in a fully depressed position relative to said pump body, a container vent opening in said pump body, an annular wall on said pump body spaced from said piston and therewith defining a vent chamber in open communication with the interior of the container via said vent opening, said plunger means having an annular skirt extending into said vent chamber for closing same at least in said depressed position and for opening said chamber in other than said fully depressed position, said skirt engaging a lower portion of said wall in said fully depressed position for closing said chamber, and said wall having means establishing an open vent passage with said skirt in said other than said fully depressed position for opening said chamber, whereby the interior of the container is vented to atmosphere in said other than said fully depressed position, and any leakage of product through said vent opening is positively prevented as said skirt engages said lower wall portion when said plunger means is locked in said fully depressed position.

4,496,083
LOOSE OR BULK GOOD CONTAINER EQUIPPED WITH A DEVICE FOR THE DISCHARGE OF LOOSE OR BULK GOODS

Hermann Gericke, Küsnacht, Switzerland, and Robert Schavilje, Hilzingen, Fed. Rep. of Germany, assignors to Gericke AG, Regensdorf, Switzerland

Filed May 14, 1982, Ser. No. 378,439
Claims priority, application Switzerland, May 22, 1981, 3380/81
Int. Cl.³ G01F 11/00
U.S. Cl. 222—231 19 Claims

1. A bulk good container arrangement comprising:
a container having a lower container portion;
a lower discharge connection provided at the lower container portion;
a rotatable discharge spiral arranged at the lower container portion;
said discharge spiral having an outer end extending into the lower discharge connection;
said discharge spiral having an inner end portion which is rotatably mounted;
rotatable drive means for driving said discharge spiral;
at least one loosening wheel for the bulk goods and arranged within the container;
a loosening wheel-holder device for rotatably mounting said at least one loosening wheel within the container above the discharge spiral;
said loosening wheel serving for loosening the portion of the bulk goods which are ready to be discharged out of the container;
said loosening wheel having an axis of rotation and defining a plane containing said axis of rotation;

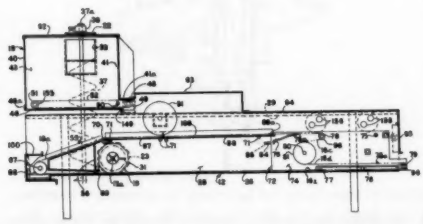


said discharge spiral having an axis of rotation;
said plane containing the axis of rotation of the loosening wheel forming with the axis of rotation of the discharge spiral at least approximately a right angle;
said loosening wheel being structured to be wider than the discharge spiral;
said container having a removable wall portion;
said loosening wheel and said loosening wheel-holder device being secured to said removable wall portion of said container; and
said removable wall portion of said container being arranged transversely with respect to said discharge spiral and being fixedly connected with said lower discharge connection.

4,496,084
BREADING MACHINE

Raymond E. Booth, Sandusky, and Michael E. Miller, Bellevue, both of Ohio, assignors to Sam Stein Associates, Inc., Sandusky, Ohio

Filed Sep. 22, 1982, Ser. No. 421,169
Int. Cl.³ B05C 19/00
U.S. Cl. 222—282 12 Claims



1. A hopper adapted for use with a breading machine for dispensing flour breading or free flowing breading onto work product, said hopper comprising a bottom wall in a horizontal plane and four vertical walls forming right angles between adjacent vertical walls, said four vertical walls including a feed

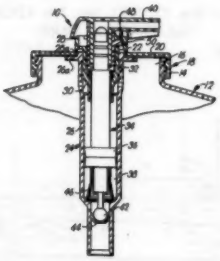
side wall and an imperforate end wall and an imperforate side wall and a discharge end wall having a bottom edge spaced above said bottom wall to form a slot between said bottom edge of said discharge end wall and said bottom wall, an endless open mesh conveyor belt with a bottom run of said conveyor belt moving in close proximity to the top of said bottom wall in a direction toward said discharge end wall and a top run of said conveyor belt moving in a direction toward said imperforate end wall and spaced above said bottom wall and all edges of said conveyor belt spaced away from said feed side wall and said imperforate side wall, said bottom run and said top run extending through said slot at said bottom of said discharge end wall to a belt driving pulley means, said bottom run and said top run also extending to an idler pulley means within said hopper and in close proximity to both said imperforate end wall and said bottom wall, a partial closure bar extending horizontally between said feed side wall and said imperforate side wall with one face of said closure bar in approximately the same vertical plane as said discharge end wall and with the top surface of said closure bar being spaced below said top run and with the bottom surface of said closure bar being spaced above said bottom run, the space between said top and said bottom runs intermediate said idler pulley and said closure bar being unobstructed for movement of dry breading material through the open mesh of said top run to said bottom wall, said closure bar being movable so as to selectively vary the space between the bottom of said closure bar and said bottom run, means for furnishing a continuous supply of finely divided dry breading material near said feed side wall, said top run and said bottom run of said conveyor belt working in concert so that said bottom run may convey said dry breading material through the rectangular slot above said bottom wall and below said bottom surface of said closure bar to discharge said dry breading material outside said hopper, and said conveyor belt being said open mesh and operative to allow sufficient dry breading material to pass through said upper run and supply said rectangular slot, said top run also being operative to move any excess of said dry breading material backing up at the bottom of said closure bar, toward said imperforate end wall.

4,496,085

DISPENSING PUMP FOR CONTAINERS WITH LARGE CLOSURES

John M. B. Ford, Lee's Summit, and Donald D. Foster, Kingsville, both of Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Jul. 22, 1982, Ser. No. 400,701
Int. Cl.³ B05B *11/00*
U.S. Cl. 222—321 **2 Claims**



1. In combination with a container having an outlet circumscribed by a neck:

a closure secured to said neck in covering relationship to said outlet,

said closure having a top wall provided with an opening therethrough; and

a dispensing pump suspended from said closure into the interior of said container and including a tubular body passing through said opening,

said pump further including a plunger reciprocable within said body and apparatus operably associated with said plunger for use in pumping products out of the container during successive strokes of the plunger,

said body having a collar attached thereto adjacent the upper end of the body provided with a tubular shank portion inserted into the upper end of the body and an annular locking portion disposed above and against said top wall of the closure and projecting radially outwardly beyond the shank portion,

said plunger being rotatable relative to the body and the collar and having a lock which is engageable and disengageable with said locking portion of the collar through said relative rotation for selectively retaining the plunger against actuation,

said body including a flange projecting radially outwardly therefrom below and against the underside of said top wall of the closure,

said flange having an outermost periphery spaced inwardly from said neck of the container,

said top wall and said body having interengaging structure precluding rotation of the body relative to the closure during said rotation of the plunger to engage and disengage the lock,

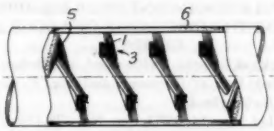
said structure including an annular boss at the upper end of said body projecting upwardly from said flange and received within said opening in the closure directly beneath said locking portion of the collar, said boss having an external surface within said opening disposed at a non-uniform distance from the axis of rotation of the plunger, said structure further including a mating edge on said top wall at least partially defining said opening and complementally engageable with said surface.

4,496,086

DEVICES WHICH COMPRISE A HELICAL SPRING USED AS CONVEYING, EXTRACTING, QUANTITY-CONTROLLING OR MIXING MEANS

Pierre Duchadeau, Sevres, France, assignor to Pari-Symac, France

Filed May 5, 1982, Ser. No. 375,228
Claims priority, application France, May 14, 1981, 81 09624
Int. Cl.³ B65G *33/08*
U.S. Cl. 222—412 **6 Claims**



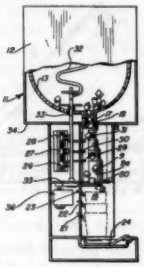
1. In a conveying, extracting, quantity-controlling or mixing apparatus having a rotating helical spring moving with respect to a rigid wall, the improvement comprising:

a helical brush member of outwardly extending supple filaments which are gripped by one of their ends in a helical member of U-shaped cross-section which is fixed laterally on the helical spring and presents the free ends of the supple filaments in contact with the rigid wall.

4,496,087
ICE DISPENSER CONTROL

James R. Marks, Lincoln Township, Berrien County, Mich., assignor to King-Seeley Thermos Co., Albert Lea, Minn.

Continuation of Ser. No. 234,170, Feb. 13, 1981, abandoned.
This application Sep. 27, 1983, Ser. No. 535,554
Int. Cl.³ G01F 11/46
U.S. Cl. 222—638 2 Claims



1. In an ice dispenser having storage means for storing ice bodies, means defining a delivery passage for conducting ice bodies from the storage means through a delivery end of the passage to a delivery space, closure means for selectively closing the passage at said delivery end for retaining ice bodies in said passage, and a plurality of divider means operable for selectively (a) permitting said passage to be undivided or (b) dividing said passage into different volume portions extending from said delivery end to permit different quantities of ice bodies to be selectively delivered through said delivery end concurrently with said closure means being disposed to open said passage at said delivery end, the improvement comprising:

stirring means for stirring ice bodies in said storage means; and

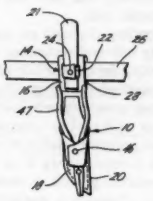
control circuit means for operating said stirring means for a first preselected period of time in response to the actuation of any of said divider means, and for operating said stirring means for said first preselected period of time in response to the passage of a second preselected period of time since the last actuation of one of said divider means, said stirring means being operated in response to said passage of said second preselected period of time only if none of said divider means has been actuated during said second period of time, said second period of time being substantially greater than said first period of time;

said control circuit means including first integrated circuit timer means for determining said first period of time, second integrated circuit timer means for determining said second period of time, clock means for providing clock pulses to said first and second timer means, logic gating means for causing said second timer means to be reset and restarted in response to the actuation of any of said divider means and for causing said first timer means to generate an output control signal for said first period of time either in response to the actuation of any of said divider means or in response to a completion of said second period of time without any of said divider means being actuated, and power supply controlling means for operating said stirring means in response to said output control signal from said first timer means.

4,496,088
TOOL HOLDER

Frederick W. Tuthill, 7601 Park Place Blvd., Houston, Tex. 77087

Filed Oct. 20, 1983, Ser. No. 543,827
Int. Cl.³ A45C 11/00
U.S. Cl. 224—253 7 Claims



1. A first tool holder for use in conjunction with a second tool holder, the second tool holder being removably attachable to a person's clothing, comprising:

a sheath body;

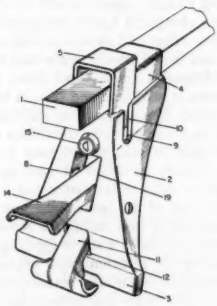
pocket means disposed on said sheath body for receiving and supporting a first tool; and

means disposed on said sheath body for superimposingly attaching the first tool holder to said second tool holder, said sheath body in unassembled form including a flat panel of flexible material, said flat panel including a lower, generally rectangular portion and a generally triangular portion extending upwardly from said rectangular portion, the side ends of said rectangular portion in assembled form being folded over fowardly and inwardly and interconnected, thereby forming said pocket means as a tapered pocket with an open bottom for receiving and supporting the first tool therewithin.

4,496,089
LOAD HOLDER

Tore Eklund, Larstorpsvägen 13, S-591 70 Motala, Sweden

Filed Jul. 27, 1983, Ser. No. 517,648
Claims priority, application Sweden, Aug. 2, 1982, 82045485
Int. Cl.³ B60R 9/04
U.S. Cl. 224—329 9 Claims



1. A load holder comprising

a support leg having an upper end for attachment to one end of an elongated carrying element and a lower end for engagement with an upper surface of drip moulding of a vehicle, said upper end including an opening;

a yoke extending into said opening of said leg, said yoke having an upper and lower portion and being slidably moveable relative to said leg, said upper portion including

an opening for insertion of said carrying element and said lower portion including a stud extending therefrom;

a first protrusion, having a guide groove therein, extending from said leg at a position between said upper and lower ends of said leg, said stud extending into said groove in said first protrusion;

an operating arm extending through an opening in said support leg and having one end for movement by an operator, and a second end;

a tensioning arm extending through an opening in said support leg and having one end including a tensioning hook for engagement with a lower surface of said drip moulding, and a second end pivotally attached to said second end of said operating arm, whereby when said operating arm is rotated about said pivotal attachment so that said stud moves to a first position relative to said guide groove said yoke is caused to move away from said upper end of said leg and said tensioning hook is caused to move away from said lower end of said leg, and when said operating arm is rotated about said pivotal attachment so that said stud moves to a second position relative to said guide groove said yoke is caused to move towards said upper end of said leg and said tensioning hook is caused to move towards said lower end of said leg.

4,496,090

SURGICAL STAPLER

Paul H. Crevier, 436 Melbourne Ave., Mount Royal, Quebec, Canada (H3P 1H2), and Istvan Lindmayer, 4390 Gilles St., Pierrefonds, Quebec, Canada (H9H 2N4)

Filed Mar. 10, 1982, Ser. No. 356,813
Int. Cl.³ A61B *17/04*
U.S. Cl. 227—19 **2 Claims**

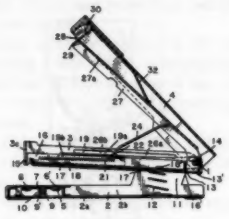
1. A stapler for inserting a staple into a pair of adjacent articles to facilitate interconnection of the articles comprising a casing including handle means thereof for manual operation of the stapler, an elongated barrel integral with said handle means defining the other end of said casing, support means at the free end of said barrel remote from said handle means for supporting a deformable staple, and fixed, substantially V-shaped anvil means at said free end of said barrel for forcing overlapping pointed free ends of a substantially U-shaped staple out of the barrel in opposite directions perpendicular to the longitudinal axis of said barrel into both said articles; plunger means slidably mounted in said barrel for bearing against the staple to deform the latter and force the pointed ends of the staple out of the barrel into said articles; trigger means at said one end of said casing for moving said plunger means from a rest position to a staple ejecting position; spring means in said casing for returning said plunger means to the rest position; control sleeve means rotatably mounted on said one end of said plunger means and projecting out of said casing for controlling movement of said plunger means in said barrel; and pin means in said casing for engaging said control sleeve means to permit or prevent movement of said plunger means in said barrel; said control sleeve means including an annular flange and an annular groove on the inner end thereof, said groove slidably receiving said pin means, a slot in said flange permitting passage of said pin means through said flange for assembling and dismantling of the stapler, the remainder of said flange preventing movement of said plunger against the staple, and a longitudinally extending channel in said sleeve connected to and perpendicular to said groove permitting longitudinal movement of said plunger against a staple.

4,496,091

STAPLER

Yasuo Yasuda, 2265-24, Togasaki, Misato-shi, Saitama-ken, Japan

Filed Sep. 28, 1982, Ser. No. 425,394
Int. Cl.³ B25C *5/02, 5/11*
U.S. Cl. 227—123 **6 Claims**



1. A stapler having a base member provided with an anvil plate, a staple magazine member and a driving member provided with a staple drive plate, said base member, staple magazine member and said driving member being pivotally secured at their base ends to one another by means of a pivot pin, characterized in that: a staple guide member is mounted in said staple magazine member for sliding movement in forward and backward directions and is spaced from the end of said magazine member to leave a staple drive clearance therebetween; a staple feeder connected to said driving member and mounted in said staple guide member for sliding movement in the forward and backward directions; and a resilient member having front and rear ends disposed around said pivot pin; said resilient member engaging said staple guide member at its front end and said staple magazine member at its rear end to bias said staple guide member forwardly.

4,496,092

ARRANGEMENT IN APPARATUS FOR MECHANICAL NAILING

Lars Billing, Värmlangdsgatan 2, S-252 52 Helsingborg, Sweden

PCT No. PCT/SE81/00244, § 371 Date Apr. 30, 1982, § 102(e) Date Apr. 30, 1982, PCT Pub. No. WO82/00792, PCT Pub. Date Mar. 18, 1982
PCT Filed Sep. 1, 1981, Ser. No. 380,678
Claims priority, application Sweden, Sep. 4, 1980, 8006182
Int. Cl.³ B25C *1/00*
U.S. Cl. 227—149 **2 Claims**

Fig 6

1. A nail holder for supporting and guiding a headed nail into position to be driven by a nail driver, the headed nail having a laterally displaced bulged guide portion restricted to a portion of the nail shank adjacent the point of the nail opposite its head, said nail holder comprising:

a main body, a nail-receiving cavity defined in the main body of the nail holder, said nail holder being positioned to abut

material to be nailed and said nail holder being adapted for simultaneously holding the nail in the nail-receiving cavity and to orient the nail with respect to the material to be nailed; and

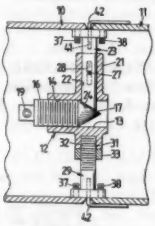
said nail receiving cavity including a nail receiving portion and a guide seat portion of oblong cross-section complementary in shape to the cross section of the laterally displaced bulged guide portion of the nail, to hold the nail in a definitely fixed angle of orientation about its longitudinal axis relative to the nail holder and said nail receiving first portion being of different and larger cross section than said guide seat portion to permit the laterally displaced bulged guide portion of the nail to move through said nail receiving first portion and into alignment with said guide seat portion whereby the nail is held in a fixed orientation when driven by a nail driver.

4,496,093

APPARATUS FOR ALIGNING ABUTTING PIPES

Julius E. Taylor, Jr., P.O. Box 721, Rte. 2, Guntersville, Ala. 35976

Filed Jun. 6, 1983, Ser. No. 501,122
Int. Cl.³ B23K *37/09*
U.S. Cl. 228—49 B **10 Claims**



1. Apparatus for aligning abutting pipes comprising:

(a) a body having an elongated opening therein adapted to extend axially of said abutting pipes with at least a portion of said opening being threaded,

(b) an elongated externally threaded actuator member in threaded engagement with the threaded portion of said opening and having a conical end defining a tapered cam surface,

(c) a radially extending extendible member carried by said body with the outer portion thereof in position to engage the internal surfaces of said abutting pipes and the inner portion thereof extending inwardly of said opening in said body and having a cam surface on its inner end in position to engage said tapered cam surface on said actuator member,

(d) at least two radially extending fixed members secured to said body in angularly spaced relation to each other and to said radially extending extendible member with the angle between adjacent radially extending members being substantially equal and the distance from the center line of said body to the outer end of each said radially extending fixed member being equal the radius of the inner surface of said abutting pipes,

and

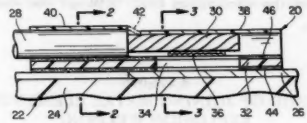
(e) means to rotate said actuator member in one direction to move it axially of said abutting pipes so that its tapered cam surface engages said cam surface on said extendible member and moves it radially and outwardly toward said internal surfaces of said abutting pipes and in an opposite direction to release said extendible member for radial movement inwardly of said internal surfaces of said abutting pipes.

4,496,094

PADDLECARD TERMINATOR

Leslie J. Allen, Swindon, England, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 8, 1981, Ser. No. 328,761
Int. Cl.³ B23K *3/00*
U.S. Cl. 228—56 **9 Claims**



1. A terminator which comprises:

(a) a first, heat stable, polymeric layer having window means therein;

(b) a second, heat recoverable, polymeric layer bonded to said first layer to form a pocket containing said window means to receive a conductor to be terminated; and

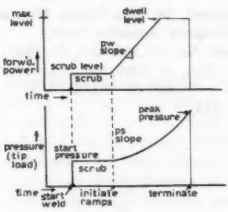
(c) a strip of solder disposed between and in operative contact with said polymeric layers and adjacent said window means; said window means being adapted to direct the flow of solder and flux from said solder strip and to permit the formation of a soldered electrical interconnection between a conductor inserted in said pocket and a substrate adjacent said first layer wherein said heat stable layer having said window means is interposed between the conductor and the substrate, and said second layer being capable of recovery to entirely encapsulate said interconnection when said terminator is heated.

4,496,095

PROGRESSIVE ULTRASONIC WELDING SYSTEM

Theodore A. Renshaw, North Babylon, and Albert Sarrantonio, Woodbury, both of N.Y., assignors to Fairchild Industries, Inc., Germantown, Md.

Filed Apr. 12, 1983, Ser. No. 484,244
Int. Cl.³ B23K *20/10*
U.S. Cl. 228—102 **19 Claims**



1. A method of welding workpieces using ultrasonic vibratory spot welding apparatus of the type having welding elements including a welding tip and a complimentary anvil both mounted on a welding frame and between which the workpieces are adapted to be inserted for welding, said welding apparatus further including clamping means for clamping together the workpieces to be welded and maintaining alignment thereof during the welding operation, said method comprising the steps of:

introducing said workpieces between said anvil and said welding tip and clamping said workpieces in a welding position;

causing one of said welding elements to move to the other of said elements to exert a first predetermined amount of pressure against the workpieces;

introducing a first predetermined amount of high frequency

ultrasonic energy into said workpieces from said welding tip;

simultaneously increasing the amounts of pressure and energy to second predetermined amounts, said second predetermined amounts being sufficient to effect a weld between said workpieces;

releasing the pressure and terminating the ultrasonic energy introduced into the workpieces; and

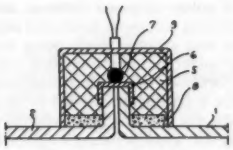
removing the workpieces from between the welding elements.

4,496,096

METHOD OF JOINING METAL ELEMENTS BY EXPLOSION WELDING

Per I. Persson, Nora, Sweden, assignor to Nitro Nobel A.B., Gyttorp, Sweden

Filed Sep. 29, 1982, Ser. No. 427,366
Claims priority, application Sweden, Oct. 26, 1981, 8106319
Int. Cl.³ B23K *27/00*
U.S. Cl. 228—107 **12 Claims**



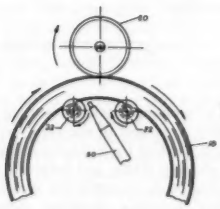
1. Method of joining two or more metal pieces wherein two of said metal pieces are normally substantially coplanar with a reference plane, comprising the steps of: (1) providing each of said coplanar pieces with a flange at an angle to said plane (2) bringing each of said flanges into proximity, and (3) detonating at least one explosive charge to weld said flanges together.

4,496,097

AUTOMATIC BELLOWS WELDER AND METHOD FOR USING SAME

Richard R. Larsen, Daytona Beach, Fla., assignor to Pacific Scientific Company, Anaheim, Calif.

Division of Ser. No. 313,283, Oct. 21, 1981,. This application Jun. 11, 1984, Ser. No. 619,776
Int. Cl.³ B23K *37/04*
U.S. Cl. 228—212 **3 Claims**



1. A method for welding together thin metallic objects each having an aperture therein comprising placing the surfaces defining the apertures in the thin metallic objects in contacting relationship with each other, rotatably engaging the outer surfaces of the thin metallic objects, rotatably engaging the surfaces defining the apertures in the thin metallic objects, and welding the contacting surfaces defining the apertures in the thin metallic objects during the rotation thereof.

4,496,098

PROCESS FOR PRODUCING A TIN/LEAD ALLOY SOLDER JOINT WITH LESS WETTING AGENT RESIDUE

Ichiro Kawakatsu, 30-13-3 chome, Saginomiya, Nakano-ku, Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,612
Int. Cl.³ B23K *1/02*
U.S. Cl. 228—219 **4 Claims**

1. In a soldering process in which a tin/lead solder alloy is to be melted to form a joint with a surface of a piece of copper or brass while the surface is protected against oxidation by being surrounded by a non-oxidizing gaseous atmosphere,

the improvement comprising:

as a preliminary step, coating said surface with a liquid wetting agent which is a mixture consisting essentially of an organic solvent having a boiling point in the range of 30° C. to 160° C., a relatively viscous polyhydric alcohol derivative having a boiling point in the range of 170° C. to 320° C., and an organic halogen-containing activator, so that as the solder joint is made so little oxidation and wetting agent residue is formed that no residue removal step likely to generate corrosion is needed; and

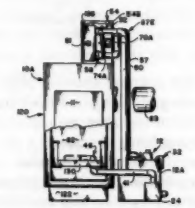
the step of melting the tin/lead solder alloy is conducted so soon after said coating step, that resulting vaporization of said organic solvent during the solder melting step contributes to said gaseous atmosphere.

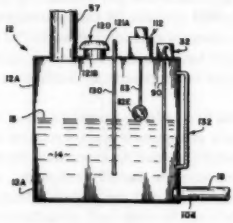
4,496,099

LOW PRESSURE HEATING SYSTEM

Garland Bull, Rte. 1, Box 235, Dardanelle, Ark. 72834

Filed Mar. 5, 1984, Ser. No. 586,138
Int. Cl.³ F24H *3/06*
U.S. Cl. 237—7 **15 Claims**





1. A low-pressure heating device for warming the areas in which the device is disposed by extracting heat from a wood burning or coal burning stove, fireplace or the like, said wood or coal burning stove, fireplace or the like having an internal fuel combustion zone, the device comprising:

a first heat exchanger adapted to be disposed within said stove or the like within said fuel combustion zone therewithin, said first heat exchanger having a first fluid inlet and a first fluid outlet;

a reservoir adapted to be disposed remotely with respect to said combustion zone for containing a preselected volume of a working heat exchange fluid such as water or the like, said reservoir being vented to the atmosphere and having at least one reservoir inlet and a reservoir outlet;

a circulating pump for extracting said heat exchange fluid from said reservoir and for pumping it to said first heat exchanger, said pump having an inlet in fluid flow communication with said reservoir outlet and a pump outlet in fluid flow communication with said first fluid inlet associated with said first heat exchanger;

a second heat exchanger adapted to be disposed remotely from said reservoir and combustion zone but elevated above said reservoir, said second heat exchanger having a second fluid flow inlet and a second fluid flow outlet;

said second fluid flow inlet coupled in fluid flow communication with said first fluid flow outlet;

said second fluid flow outlet coupled in fluid flow communication with at least one of said reservoir inlet(s);

fan means for forcing air through said second heat exchanger to extract and distribute heat therefrom;

immersion control switch means operatively associated with said reservoir for initiating operation of said pump whereby to establish fluid recirculation between said reservoir and said first and second heat exchangers;

fan control means for energizing said fan means when the temperature of fluid within said second heat exchanger reaches a first preselected temperature; and,

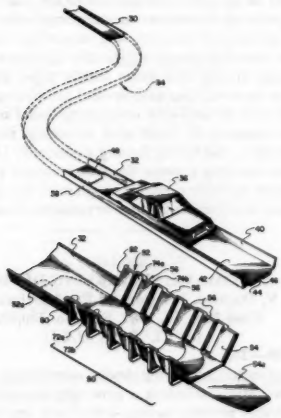
said immersion control means being responsive to thermocouple means disposed within said reservoir for turning off said pump when the temperature of fluid within said reservoir exceeds a preselected safe maximum temperature, whereupon hot fluid disposed within said second heat exchanger will drop downwardly into said reservoir.

4,496,100

FLEXIBLE TRACK

Frederic A. Schwager, and Willis C. Kainsinger, both of Manhattan Beach, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 18, 1982, Ser. No. 434,815
Int. Cl.³ A63H *18/02*
U.S. Cl. 238—10 R **20 Claims**



1. In a track system for forming a roadway for travel thereon of miniature vehicles, the combination comprising:

at least a first and second track sections;

means on said first track section including an arcuate surface portion having rib means in depending relation to the periphery thereof; and

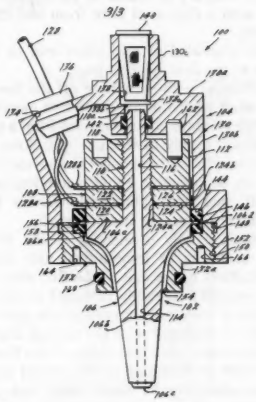
means on said second track section including a first surface portion having slot means therein configured for interlocking relation with said rib means and a second surface portion having an arcuate edge of substantially the same radius as the edge of said arcuate surface portion, the two edges being in proximate relation with the sections interlocked with said second surface portion and the surface of said arcuate surface portion defining part of the roadway, said rib means and said slot means being so dimensioned and configured for enabling pivoting between adjacent sections when so interconnected while providing friction for maintaining the pivoted position once fixed.

4,496,101

ULTRASONIC METERING DEVICE AND HOUSING ASSEMBLY

Bradley L. Northman, Oak Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 11, 1982, Ser. No. 387,388
Int. Cl.³ B05B *3/14*
U.S. Cl. 239—102 **6 Claims**



1. In a fluid injector including an acoustic horn defining a nozzle assembly having a longitudinal axis, a longitudinally extending passage, and means at one end of the nozzle assembly for discharging fluid from the passage; means at the other end of the nozzle assembly for longitudinally vibrating the nozzle assembly; a housing assembly having the discharge end of the nozzle assembly extending therefrom; and a fluid inlet defined by the housing assembly; the improvement comprising:

passage means disposed within the housing assembly for supplying pressurized fluid from the fluid inlet to the longitudinally extending passage, said passage means having at least one end disposed along an axis substantially parallel to the longitudinal axis and moveable relative to at least one of the assemblies;

first and second disk-shaped piezoelectric crystals each having a central opening;

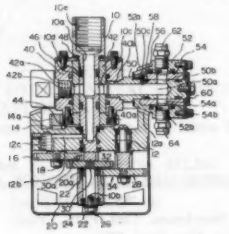
a disk-shaped conductor element sandwiched between said crystals and, said conductor having a central opening somewhat larger than the central openings in said crystals and having means to concentrically orient at least one of the crystal openings with the conductor opening; and

fastener means extending through said openings for securing said crystals to the nozzle.

4,496,102
CLEANING APPARATUS

Takao Miura, Urawa, and Isao Miura, Kawaguchi, both of Japan, assignors to Miura Machinery Works Co., Ltd., Kawaguchi, Japan

Filed Jun. 24, 1982, Ser. No. 391,661
Claims priority, application Japan, Sep. 8, 1981, 56-133373
Int. Cl.³ B05B 3/02, 3/04
U.S. Cl. 239—227 16 Claims

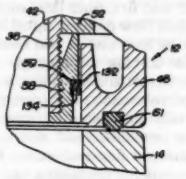


1. A cleaning apparatus for an enclosure comprising:
a stationary support member having a first ejection port;
a first shaft securely mounted to the support member and formed with a first axial bore from one end toward the other end;
an impeller journaled to said other end of the first shaft adjacent to the first ejection port;
a first distribution path branching off the first axial bore in the first shaft to distribute to the first ejection port liquid under high pressure communicated from a source of pressurized liquid supply to the first axial bore;
a first hollow cylindrical member supported on the support member to be rotatable about a longitudinal axis of the first shaft, said first cylindrical member having a first sleeve slidably engaging the first shaft;
a second shaft fixedly connected to the first cylindrical member such that a longitudinal axis thereof extends perpendicularly to the axis of the first shaft;
an ejector assembly rotatably mounted on the second shaft and having at least one second ejection port therein and a second sleeve engaged with the second shaft;
a second distribution path branching off the first axial bore in the first shaft to distribute to the second ejection port in the ejector assembly the liquid under high pressure communicated from the source of pressurized liquid supply to the first axial bore;
transmission means for transmitting rotation of the impeller to the first cylindrical member to cause the ejector assembly to revolve about the axis of the first shaft through the first cylindrical member and the second shaft;
means for causing the ejector assembly to rotate about the axis of the second shaft simultaneously with the revolution around the axis of the first shaft;
ejection control means for controlling the pressure of the driving jet to a desired value, regardless of the pressure of the cleaning jet, said ejection control means including a nozzle housing securely mounted to the first ejection port of the support member, said nozzle housing having a nozzle hole and an adjustable nozzle needle in the nozzle hole, and
sealing means interposed between the first sleeve on the first cylindrical member and the first shaft and between the second sleeve of the ejector assembly and the second shaft, each of the sealing means comprising an annular flat strip made of a material having a low friction coefficient and wound on the bottom of a first annular recess which is formed in the outer periphery of the shaft, an O-ring and a plurality of backup rings which are coupled side by side on the flat strip in the first annular recess;
whereby the liquid from the source of pressurized liquid supply is ejected from the first ejection port of the support member as a driving jet for driving the impeller and from the second ejection port of the ejector assembly as a cleaning jet for cleaning the interior of the enclosure.

4,496,103
REACTION DRIVE SPRINKLER

Edward J. Pitchford, Glendora, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Division of Ser. No. 377,552, May 12, 1982, Pat. No. 4,434,937.
This application Sep. 22, 1983, Ser. No. 534,804
Int. Cl.³ B05B 3/08
U.S. Cl. 239—230 9 Claims



1. In a rotatable water sprinkler having a range tube for rotatable connection with respect to a water supply pipe to receive water from the supply pipe and to project the water in the form of at least one water stream in a generally lateral direction with a selected angle of inclination with respect to the supply pipe, the improvement comprising:
reaction drive means including a drive arm pivoted with respect to the range tube and supporting at least one deflector spoon oriented for selectively interrupting the projected water stream resulting in reaction forces to rotate the range tube with respect to the supply pipe;
means for mounting said range tube at the end of the water supply pipe for rotation with respect thereto; and
means responsive to increases in the pressure of water in the supply pipe for increasing frictional resistance to rotation of said range tube with respect to the water supply pipe, said pressure responsive means comprising an annular lip seal interposed between said mounting means and said range tube and having a generally U-shaped cross section opening toward the water supply pipe, and an annular spring received into said lip seal for biasing the opposite leg of said lip seal into normal frictional sealing engagement respectively with said mounting means and said range tube, said spring having a generally U-shaped cross section opening toward the water supply pipe such that increases in water pressure supplement the spring force to increase frictional resistance to rotation of said range tube.

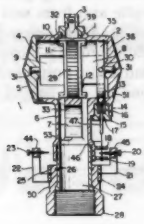
4,496,104
AUTOMATIC SPRINKLING DEVICE

Joseph C. V. Ducasse, 391 Donegal Pl., Martinez, Calif. 94553

Filed May 21, 1982, Ser. No. 380,992
Int. Cl.³ B05B 03/04
U.S. Cl. 239—240 11 Claims

1. An automatic sprinkling device comprising:
a hollow casing including a generally vertically extending cylindrical portion having lower and upper ends and a generally horizontally extending cylindrical portion integral with said upper end of said vertical portion;
coupling means, rotatably and sealingly connected to said lower end of said vertical portion of said casing, for connecting said casing to a source of pressurized fluid;
a nozzle fixed to and extending from said horizontal portion of said casing and communicating with the interior thereof for spraying therefrom a jet of pressurized fluid;
propeller means positioned within said casing to be con-

tacted by pressurized fluid passing therethrough for causing said casing and said nozzle to rotate with respect to said coupling means, said propeller means comprising a first turbine wheel mounted within said horizontal portion, and propeller blades fixed to and extending axially from opposite ends of said first turbine wheel, said propeller blades being noncoplanar with respect to each other;



control means for selectively regulating and reversing the rotation of said casing and said nozzle with respect to said coupling means; and

means mounted within said casing and contacted by the pressurized fluid passing therethrough for periodically restricting the jet of pressurized fluid sprayed from said nozzle.

4,496,105

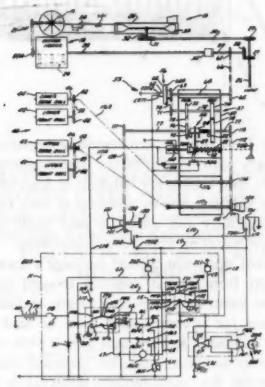
FORAGE HARVESTER DRIVE AND ELECTRIC CONTROL THEREFOR

Philip F. Fleming; Virgil B. Martin, both of West Bend; Roger L. Villers, Waubeka, and Jaime J. Shutes, West Bend, all of Wis., assignors to Gehl Company, West Bend, Wis.

Filed Nov. 15, 1982, Ser. No. 441,946

Int. Cl.³ B02C *25/00*

U.S. Cl. 241—32 **12 Claims**



1. A forage harvester adapted to be propelled and powered by a tractor comprising:

a blower;

a cutterhead mechanism for supplying cut crop material to said blower;

a feed roll mechanism for feeding crop material to said cutterhead mechanism;

an attachment drive shaft;

drive means for driving said blower and said cutterhead mechanism;

a drive mechanism for supplying motive power from said drive means to said feed roll mechanism and said attachment drive shaft, said drive mechanism comprising an electric clutch and a shiftable forward/reverse transmission;

a first torque responsive mechanical clutch connected between said transmission and said feed roll mechanism;

a second torque responsive mechanical clutch connected between said transmission and said attachment drive shaft;

each of said torque responsive mechanical clutches being adapted to disengage when overloaded;

means selectively operable to effect shifting of said transmission between forward and reverse;

and an electrical control system comprising switch means selectively operable to effect engagement and disengagement of said electric clutch;

and fault switch means responsive to disengagement of either of said first and second torque responsive clutches to effect disengagement of said electric clutch.

4,496,106

AGITATOR-GRINDER

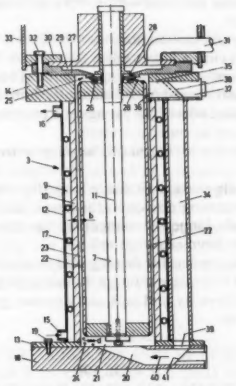
Horst Gross, Lampertheim, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,365

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106062

Int. Cl.³ B02C *17/16*

U.S. Cl. 241—46.17 **10 Claims**



1. An agitator-grinder for performing wet-grinding of stock material comprising:

a grinding vessel having an agitator mechanism comprising a cylindrical hollow body disposed in the grinding vessel and drivable at high speed,

a narrow annular-cylindrical chamber partially filled with auxiliary grinding bodies defining a grinding chamber between said agitator mechanism and a wall of the grinding vessel, the inner walls of said grinding chamber being of complementary cylindrical shape and forming therebetween a gap of from 5 mm to 10 mm width, the ratio of gap width b to grinding body diameter d being about 5 to 20, and the speed of the agitator mechanism at its periphery being froms 5 to 40 m/sec,

a grinding stock inflow conduit discharging into said grinding chamber at one end and a separating device at the other end thereof for separating ground stock from the auxiliary grinding bodies,

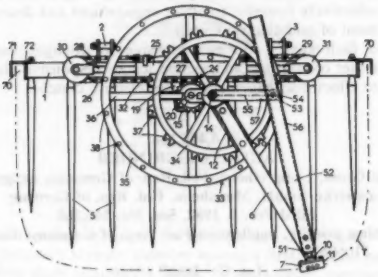
a return flow conduit extending from said grinding chamber in the vicinity of said separator device back into the vicinity of said grinding stock inflow conduit,

said conduit being attached in a stationary manner to said grinding vessel, and including means for varying the cross-section of a portion of said return flow conduit.

4,496,107
MACHINE FOR REMOVING BLOCKS OF FORAGE FROM A SILO

Edmond Oberle, Saverne; Bernard Wattron, Marmoutier, and Jeannot Hironimus, Saverne, all of France, assignors to Kuhn S.A., Saverne, France

Filed Jul. 16, 1982, Ser. No. 398,964
Claims priority, application France, Jul. 23, 1981, 81 14512
Int. Cl.³ A01F *29/00*
U.S. Cl. 241—101.7 **27 Claims**



1. A machine for removing blocks of forage from inside a horizontal silo,

comprising in combination,

a chassis having a lower part;

a plurality of prongs arranged on the lower part of the chassis and extending substantially horizontally;

an arm located above the prongs at a predetermined distance and having an outer extremity;

a cutting device arranged on the outer extremity of the arm;

a crank;

a substantially vertical first axle hingedly connecting the arm with the cutting device to the crank; and

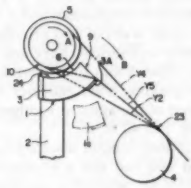
a second axle hingedly connecting the crank to the chassis and offset from said first axle;

crank driving means for driving said crank about said second axle, said means including a double acting hydraulic jack, a chain driven by said jack and a crown gear integral with each crank.

4,496,108
BUNCH WINDING DEVICE IN WINDING MACHINE

Syoichi Tone, Kyotoshi; Koji Deno, Ohmihachimanshi, and Akio Matsushima, Kyotoshi, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Oct. 17, 1980, Ser. No. 197,965
Claims priority, application Japan, Oct. 22, 1979, 54-136575
Int. Cl.³ B65H *54/02, 67/04*
U.S. Cl. 242—18 PW **4 Claims**

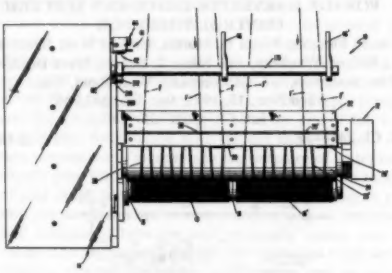


1. A bunch winding device for a winding machine including a cradle arm, a drum having a traverse region, a bobbin holder secured to the cradle arm for rotatably mounting a bobbin adjacent the drum, and means for mounting said cradle arm for movement between a first position wherein the bobbin engages said drum and a lifted position wherein said bobbin holder and bobbin are spaced from said drum, comprising an L-shaped bunch winding-regulating guide having a longitudinal plate with a top end and top face being attached to the cradle arm below the bobbin holder so that the bunch winding-regulating guide is in engagement with a yarn extending from the drum toward the yarn end gripped by an end face of the bobbin and bobbin holder when the cradle arm is located in said lifted position, and it releases said engagement with the yarn on movement of the cradle arm from said lifted position to said first position, wherein the longitudinal plate of said L-shaped bunch winding-regulating guide is located outside the traverse region of the drum and is also positioned between the traverse region of the drum and the end face of the bobbin.

4,496,109
APPARATUS FOR CUTTING, ASPIRATING AND RETHREADING A TRAVELING FILAMENTARY YARN

Max L. Cardell, Shelby, N.C., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 258,309, Apr. 28, 1981, abandoned. This application May 27, 1983, Ser. No. 499,005
Int. Cl.³ B65H *54/02, 67/04*
U.S. Cl. 242—18 R **22 Claims**



1. Automatic filamentary yarn handling apparatus for use with a filamentary yarn winder of the type comprising a yarn package support, and means for rotating at least one package about an axis of said support to wind-up at least one filamentary yarn continuously fed along a yarn path toward the winder, said yarn handling apparatus comprising:

gathering means upstream of said package's rotary axis for displacement from a rest position toward the path of travel of the yarn, said gathering means including:

cutter means for severing said yarn as said gathering means is displaced toward said yarn's path of travel,

suction means including an inlet disposed adjacent said cutter means for continuously drawing-in said yarn after severing has occurred,

yarn transfer means, including at least one guide associated with said yarn being transferred, mounted for movement relative to said gathering means between spaced positions, said guide being arranged to engage said yarn upon said gathering means returning to its rest position with the severed yarns, and

displacement means for:

moving said transfer means relative to said gathering means with the yarn remaining engaged with said guide, and

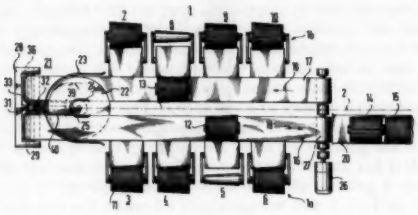
moving said guide toward the package axis during a yarn rethreading sequence.

4,496,110

DOUBLE-SIDED TEXTILE MACHINE

Hans Raasch; Hans Grecksch, and Klaus Bock, all of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 590,015
Int. Cl.³ B65H *54/20, 67/04*
U.S. Cl. 242—35.5 A 10 Claims



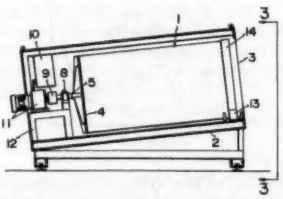
1. Double-sided textile machine, comprising a plurality of spool assemblies for producing cross wound bobbins, a spool collecting station at an end of the machine, a first spool transport belt disposed at one side of the machine for receiving cross wound bobbins from at least one of said spool assemblies and for transporting the bobbins toward said spool collecting station in a given transporting direction with the bobbins axially aligned in said given transporting direction, a second spool transport belt disposed at the other side of the machine for receiving cross wound bobbins from at least one of said spool assemblies and for transporting the bobbins in a direction opposite said given transporting direction, and a device for successively receiving the cross wound bobbins from said second spool transport belt, for turning the bobbins through substantially 180° and for transferring the bobbins to said first spool transport belt.

4,496,111

APPARATUS FOR AND METHOD OF REMOVING WOUND PAPER FROM A CORE ROD

Kishiro Ohishi, and Choji Kato, both of Niigata, Japan, assignors to Hokuetsu Kamiseisen Kabushikikaisha, Niigata, Japan

Filed Feb. 16, 1983, Ser. No. 467,091
Int. Cl.³ B65H *75/02*
U.S. Cl. 242—55 4 Claims



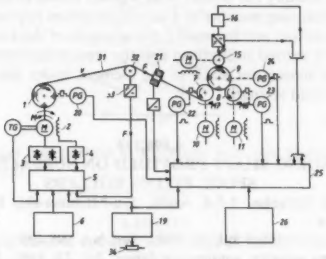
1. A method of removing wound paper from a core rod, said method comprising the steps of rotating a cylindrical container around its axis and placing said core rod inside said container in the direction of said axis, said container being adapted to maintain said rod in the direction of said axis.

4,496,112

METHOD OF CONTROLLING A WEB WINDING PROCESS

Ingemar Olsson; Göran Ottosson, and Bengt Sinner, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Mar. 30, 1983, Ser. No. 480,280
Claims priority, application Sweden, Apr. 1, 1982, 8202095
Int. Cl.³ B65H *17/08, 59/08*
U.S. Cl. 242—66 5 Claims



1. A method of controlling the web tension of a web roll, in particular a paper web roll, being wound in a winder including two individually driven web roll supporting rollers, comprising:

deriving separate signals representative of the speed of rotation of each supporting roller:

controlling the speed or rotation of each driven supporting roller, in dependence on the difference between the said signals, thereby to control the said web tension of the web roll;

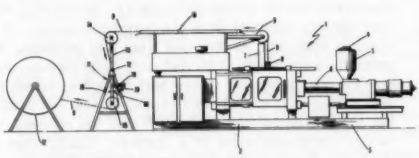
including measuring the number of wound turns and the wound web length of the web of a measuring period, the resulting measurement signals being supplied with information about the surface weight of the web to a device for computing a density signal for the portion of the web roll formed during the measuring period, the density signal being used as a superordinate control signal for controlling the web tension of the web roll.

4,496,113

INTEGRATED PROCESS FOR PREPARING A CONTINUOUS STRING OF MOLDED ARTICLES WOUND IN A COIL

C. Bruce Dawson, Winchester, Va., assignor to O'Sullivan Corporation, Winchester, Va.

Continuation-in-part of Ser. No. 316,033, Oct. 28, 1981, Pat. No. 4,445,836. This application Apr. 4, 1983, Ser. No. 481,825
Int. Cl.³ B65H *17/02*
U.S. Cl. 242—67.1 R 8 Claims



1. In a process for winding-up a continuous element which is being advanced toward a winder, the process including the steps of intermittently winding the element and taking-up slack in the element in between the winding sequences, said process comprising the steps of:

taking-up slack in the element which would otherwise occur when the element is advanced and the winder is stopped, by:

engaging a tensioning member against the element,

biasing the tensioning member with a biasing force in a first direction for taking-up slack, so that the tensioning member is displaced by the biasing force when the element is advanced,

actuating rotation of the winder to initiate a wind-up sequence following a given extent of travel of the tensioning member in the first direction while the tensioning member yieldably opposes the winding of the element with a biasing force of a first strength, and

deactivating the winder after a given extent of travel of the tensioning member in a second direction opposite the first direction and increasing the strength of the biasing force to a second strength so that the tensioning member takes-up subsequent slack in the element under the increased second strength.

4,496,114
WINDING SHAFT PROVIDED ON SURFACE WITH SPOOL FIXING ROLLERS

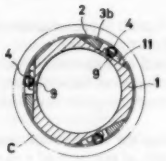
Hiroshi Kataoka, 1-5-8 Asahi, Iyo-Mishima-shi, Ehime-ken, Japan

Filed Jul. 14, 1982, Ser. No. 398,439

Claims priority, application Japan, Jul. 22, 1981, 56-113619; Aug. 3, 1981, 56-120670; Oct. 13, 1981, 56-161975

Int. Cl.³ B65H *75/24*

U.S. Cl. 242—68.2 **16 Claims**



2. A winding shaft for a strip of sheet material, said winding shaft being provided on the surface thereof with rolling bars for fixing a spool, said winding shaft comprising:

flat recesses disposed equidistantly in the circumferential direction on the outer periphery of the winding shaft, said flat recesses being flat surfaces formed by cutting surface segments of a width slightly larger than the length of rolling bars off the outer periphery of the winding shaft;

opposed side walls defining the axial ends of said flat recesses, said opposed side walls having opposed lateral grooves formed in their lower portions;

rolling bars each having hollow portions formed on the opposite ends thereof and being capable of being rolled on said flat recesses in a posture parallel to the axis of the winding shaft, said rolling bars having a thickness such that, even when they are located at the positions most separated from the peripheral surface of the winding shaft, they slightly protrude from the peripheral surface of the winding shaft and, as they roll from said positions, they protrude increasingly from said peripheral surface; and

means for restraining said rolling bars in such a manner that said rolling bars are allowed to roll on said flat recesses but are prevented from falling off said flat recesses, said means comprising axles of a diameter smaller than the diameter of said hollow portions of said rolling bar and said opposed lateral grooves formed in the said opposite side walls, the end portions of each of said axles, when passed through said hollow portions of said rolling bars, entering said lateral grooves and being allowed to move independently in a straight line parallel to said flat surfaces over a necessary distance in consequence of the rolling motion of saidrolling bars to enable said rolling bars to protrude greatly.

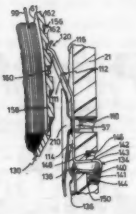
4,496,115
RATCHET SPRING

John R. Kreft, and Elvis W. Moss, both of Tulsa, Okla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Nov. 4, 1982, Ser. No. 439,367

Int. Cl.³ A01K *89/01, 89/02*

U.S. Cl. 242—84.1 R **4 Claims**



1. In a fishing reel having a body with a deck plate having an opening therein, a line-carrying spool rotatable about an axis extending lengthwise of the fishing reel and a rearwardly facing surface on the spool with serrations arranged annularly about the surface, a ratchet spring comprising:

a first spring portion having a flat surface for engagement with the deck plate;

a second portion extending from the first portion angularly and away from the deck plate and toward the rearwardly facing surface of the spool, and movable relative to the first portion towards and away from the deck plate;

means on the first portion engaging within the opening in the deck plate to secure the ratchet spring relative to the deck plate, said means engaging the opening comprising a protrusion extending from the plane of the first portion and having outwardly disposed sides, the sides being press fit within the opening to anchor the ratchet spring relative to the deck plate, the second portion having means engaging the serrations such that upon rotation of the spool a clicking is audible as a result of the spring addressing the serrations to alert an operator of the reel that line carried on the spool is being withdrawn.

4,496,116
AUTOMATIC LOCKING RETRACTOR

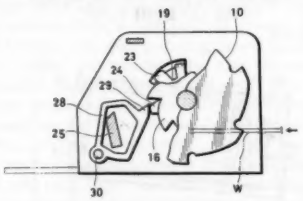
Katsuyasu Ono, Fujisawa, Japan, assignor to Nsk-Warner K. K., Japan

Filed Aug. 22, 1983, Ser. No. 525,308

Claims priority, application Japan, Aug. 31, 1982, 57-132200[U]

Int. Cl.³ A62B *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.4 D **6 Claims**



1. An automatic locking retractor comprising a casing, a take-up spindle rotatably supported on the casing and urged in the winding direction of an webbing, a cog wheel mounted integrally on the take-up spindle, a ratchet wheel rotatable together with the cog wheel, a disk rotatable in association with rotation of the take-up spindle by virtue of a friction force, turnable over a predetermined angle and defining a first and second projections on the outer circumference thereof, a

lock lever displaceable between a first position where the lock lever is in engagement with the cog wheel and a second position where the lock lever permits free rotation of the cog wheel, a pawl displaceable between an engagement position where the pawl is in engagement with the ratchet wheel, an intermediate position where the pawl is engageable with the ratchet wheel and a non-engagement position where the pawl is kept out of engagement with the ratchet wheel, and sensor means coupled with the pawl and adapted to hold the pawl in the non-engagement position when the webbing has been wound up over a predetermined length or longer, in which the pawl assumes the non-engagement position and is kept in contact with the first projection of the disk when the webbing, which has been wound up on the take-up spindle, is pulled out, assumes the intermediate position and is kept in contact with the second projection of the disk when the webbing has then been rewound over a predetermined small length, and is then guided to the engagement position when the webbing is again pulled out; and means for displacing the lock lever from the second position to the first position as the pawl is displaced from the intermediate position to the engagement position.

4,496,117

WEB TRANSPORT DEVICE

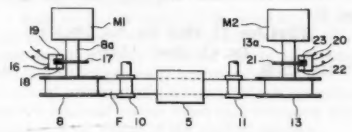
Kazuo Kashiwagi, Tokyo, and Masanari Shirai, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 545,924

Claims priority, application Japan, Nov. 1, 1982, 57-192189; Nov. 1, 1982, 57-192190

Int. Cl.³ B65H *59/38*; G03B *1/02*; G11B *15/13*

U.S. Cl. 242—191 **6 Claims**



1. A web transport device for transporting a web wound on an unwinding rotary member to a winding rotary member by the rotation thereof, comprising:

measuring means for measuring the rotating speed of the unwinding rotary member and of the winding rotary member;

first computing means for calculating the ratio of the rotating speed of the unwinding rotary member and of the winding rotary member within a predetermined period in the course of web transport;

second computing means for calculating the ratio of the rotating speeds of the unwinding rotary member and of the winding rotary member at the end of web transport on the basis of a value calculated by said first computing means at the start of web transport; and

transport control means for comparing the results of calculations of said first and second computing means and controlling the drive for said rotary members in response to the result of said comparison.

4,496,118

MAGNETIC TAPE CASSETTE

Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

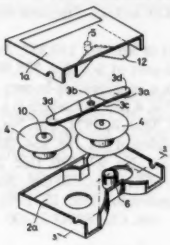
Filed May 13, 1983, Ser. No. 494,483

Claims priority, application Japan, May 13, 1982, 57-68717

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—198 **5 Claims**

1. A magnetic tape cassette comprising: upper and lower half portions joined to define a cassette body, said lower half portion having a photo-sensor insertion hole, a tape supply reel and a tape winding reel disposed in said cassette body, an elastic reel retaining plate for depressing the tops of said reels and, means for securing said retaining plate to an inner surface



of said upper half portion in alignment with said photo-sensor insertion hole.

4,496,119

MAGNETIC-TAPE CASSETTE WITH SIMPLIFIED REEL BRAKE

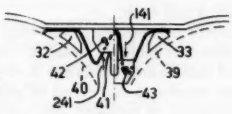
Joannes H. F. C. Sieben, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,058

Claims priority, application Netherlands, Feb. 9, 1983, 8300476

Int. Cl.³ G03B *1/04*; G11B *15/22, 15/32*

U.S. Cl. 242—198 **6 Claims**



1. A magnetic-tape cassette comprising a housing having a major wall and a rear wall; two adjacent reels mounting in the housing for rotation about respective axes perpendicular to said major wall, each of said reels having a flange; and brake means for tensioning a tape wound around and extending between said reels, and preventing rotation of said reels in the direction which loosens said tape when the cassette is not in use,

characterized in that said brake means comprises a ridge arranged on the inner side of said major wall of the housing, and extending substantially perpendicularly to the rear wall between said reels,

two projections arranged on said major wall, each projection being arranged adjacent a respective reel, one to each side of said ridge,

a single brake spring having a central portion secured near an end of said ridge, respective intermediate portions arranged in a space between the rear wall and the respective projections, and braking portions near the two respective ends of the brake spring for engaging respective flanges, and

a slide member slidable along said ridge, having means for engaging said brake spring at locations disposed to each side of the central portion of the spring, arranged such that movement of the slide member along said ridge in either of first and second opposite directions respectively moves said braking portions of the brake spring toward the flanges, and away from said flanges.

4,496,120

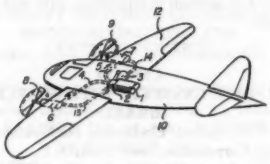
ARRANGEMENTS OF OR TO PROPELLERS TO IMPROVE THE CAPABILITIES OF PROPELLER-DRIVEN CRAFT

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 110,157, Jan. 7, 1980, which is a continuation-in-part of Ser. No. 895,687, Apr. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, Pat. No. 4,136,845, which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898, said Ser. No. 330,980, is a division of Ser. No. 954,555, Oct. 25, 1978, Pat. No. 4,358,073, and Ser. No. 973,780, Dec. 27, 1978, which is a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, Pat. No. 4,136,845. This application Dec. 15, 1981, Ser. No. 330,980

Int. Cl.³ B64D *27/00*

U.S. Cl. 244—56 **5 Claims**



1. On an airfoiled wing, in combination, a streamlined sectional configuration of said wing with a longitudinal span and a relatively thereto normal chord, a fluid motor associated to said wing to carry and to revolve by fluid which flows from a fluid supply source through a rotor of said motor a propeller which is fastened to said rotor,

wherein said motor is connected to said wing by a structure,

wherein said structure includes means to swing said motor upwards and downwards in normal direction relative to said span and parallel to said chord of said wing,

wherein said structure is provided with means to keep the axes of said rotor and propeller at all times substantially parallel to said chord, and,

wherein fluid line portions which include rigid pipes and moveable fluid line portions are provided in said structure and between the ports of said motor and said supply source to permit the flow of fluid to and from different locations of said ports of said motor.

4,496,121

CONTROL SURFACE LOCK FOR FLUTTER CONSTRAINT

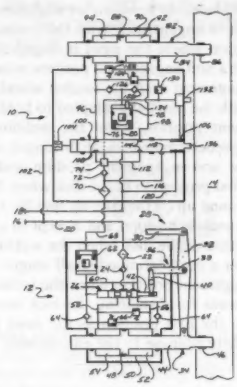
J. Burton Berlin, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 21, 1982, Ser. No. 420,725

Int. Cl.³ B64C *13/14, 13/42*

U.S. Cl. 244—75 A **15 Claims**

10. A hydromechanical lock adapted for flutter constraint redundancy in the restraint of an aircraft control surface, comprising an hydraulic cylinder receiving reciprocable piston means disposed intermediate first and second charged chambers and in operative communication with an hydraulically-actuated surface to be locked upon loss of hydraulic pressure; biased bypass valve means having first and second sets of flow ports each disposed in registration for series flow of fluid between said first and second chambers respectively, said bypass valve means being biased for registration of said flow ports by said hydraulic pressure; flow splitter means having a first flow path in said series flow between said chambers and a second, fluid-interchanging, parallel flow path in communication with hydraulic return; wherein loss of said hydraulic pressure removes open biasing on said bypass valve means,



interrupts said series flow and locks said piston means and associated surface to be locked.

4,496,122

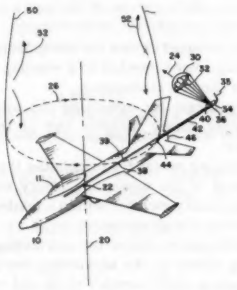
EXTENDED MOMENT ARM ANTI-SPIN DEVICE

Raymond D. Whipple, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 27, 1983, Ser. No. 508,371

Int. Cl.³ B64C *17/00*

U.S. Cl. 244—75 R **4 Claims**



1. A device which corrects aerodynamic spin during aircraft operation comprising:

an aircraft;

extendable boom means housed completely within the aircraft;

said extendable boom means forming an extension of an anti-spin moment arm of said aircraft when extended from the tail of the aircraft;

parachute means carried by said extendable boom means at the end thereof remote from the aircraft;

means for deploying said parachute means for exerting an anti-spin force at the end of said moment arm;

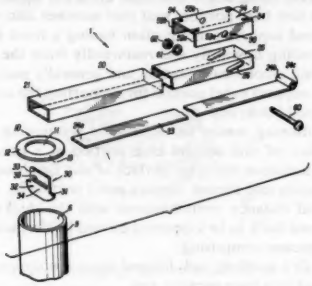
said parachute means having a diameter and said extendable boom means having a length permitting relative reduction in parachute size necessary to accomplish spin correction and continued flight of the aircraft without release of the parachute means.

4,496,123

EXTENDABLE SUPPORT

Roland A. Laramie, 13 Cedar Dr., Sterling, Va. 22170

Filed Dec. 14, 1982, Ser. No. 449,673
Int. Cl.[3] F16L 3/00
U.S. Cl. 248—121 20 Claims



1. An extendable mailbox support for selectively supporting a mailbox in either an unextended or a horizontally extended position, comprising:

(a) a support member including a recess;

(b) an extension arm for horizontally extending said mailbox which is slidably extendable out of and retractable into said recess and which connects said mailbox to said support member, wherein said arm includes:

(i) a proximal pivotal mounting on its proximal end for supporting said mailbox in said horizontally extended position when said arm is slidably extended out of said recess and pivoted, and

(ii) a distal pivotal mounting on its distal end for reorienting said mailbox back into its initial orientation when said arm is slidably extended out of said recess and pivoted into a generally horizontal position

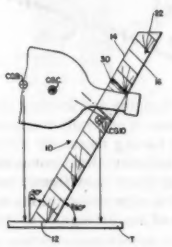
wherein said proximal pivotal mounting is completely retractable into said recess when said extension arm is retracted into the recess of the support member.

4,496,124

BOTTLE SUPPORT

Gerald Cole, Victor, N.Y., assignor to Creative Cellars, Inc., Ft. Washington, Md.

Filed Sep. 15, 1983, Ser. No. 532,805
Int. Cl.[3] A47G 23/02
U.S. Cl. 248—146 13 Claims



1. A bottle and support comprising:

(a) a body including a base surface,

(b) said body extending upwardly from said base surface at an angle to the vertical,

(c) the center of gravity of said body being above a point outside said base surface,

(d) means on said body for supporting a bottle,

(e) said bottle supported by said supporting means and having a center of gravity above a point on the opposite side of that edge of the base surface nearest said first point from said first point,

(f) the combined center of gravity of said body and said bottle being above a point within said base surface,

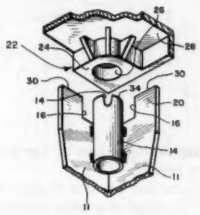
(g) said base surface being the sole support for said body and said bottle.

4,496,125

SUPPORT LEG ASSEMBLY

Thomas J. Walsh, Evanston; Robert Bachman, Highland Park, both of Ill., and Ronald Aderhold, Selden, N.Y., assignors to Fiat Products Incorporated, Plainview, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,618
Int. Cl.[3] F16M 11/20
U.S. Cl. 248—188 29 Claims



1. A supporting leg for use with a leg coupler which defines a socket within a base located at a lower surface of an object to be supported, the socket being constructed to receive a tubular element, said supporting leg comprising:

a longitudinally extending, elongated leg member having at least two longitudinal leg sections joined together with an angle therebetween, each of said sections defining a respective end surface extending across a portion of the width of the leg;

a tube attached to said leg member at one end thereof adjacent the end surfaces and defining a tube end surface extending across the width of the tube;

said tube sized and shaped to fit into said socket when said supporting leg is engaged with said leg coupler such that load bearing contact is made by said leg end surfaces against the lower surface of said object to be supported and load bearing contact is made by the tube end surface against an abutting surface of said socket;

wherein each leg section is formed with a slot adjacent the respective leg end surface cut from the angle therebetween to a point along the width of the leg member sufficiently far from the angle to permit the slot to fit over the leg coupler and to allow said load bearing contacts to be made.

4,496,126

TABLE MOUNTED UNIVERSALLY POSITIONABLE BOOK HOLDER ENABLING READERS TO TURN PAGES EASILY WITHOUT HANDS

R. Stanley Melton, Rte. 2, Box 199A, and James R. Davis, Rte. 2, Box 234, both of Ellenboro, N.C. 28040

Filed Jul. 13, 1982, Ser. No. 397,917
Int. Cl.[3] A47B 23/04
U.S. Cl. 248—447.2 1 Claim

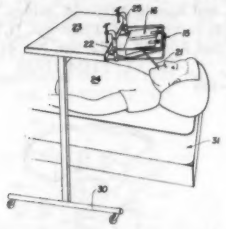
1. A book holder for use by readers without arm mobility adapted to hold a book in position for reading with pages displayed to enable turning by means of a rubber tipped stick held in the mouth, comprising in combination:

a pair of spaced front and rear juxtaposed rectangular frames of open framework metal rod construction for holding and positioning a book opened in reading posture with the

book pages displayed at a substantially unobstructed sighting position for reading,

book cover holder means carried by the rear rectangular frame for engaging and holding in place in opened posture for reading the two covers of a book,

a pair of monofilament lines connected on opposite ends of said front rectangular frame facing the reader and disposed across the sighting position to contact open pages of the book and hold them open for reading without substantial visual interference of book pages said monofilament



lines permitting manipulation of the pages by the stick employed by a reader,

mounting means carried by said frames for attaching the framework to the edge of a table to hold the book in said reading posture comprising a pair of clamps extending from said framework for clamping to a table edge,

a pivotable mount for said clamps on said framework to permit varying of the angular relationship of the framework with the clamp, and

locking means to hold the pivotable mount secure in a selected mount position.

4,496,127

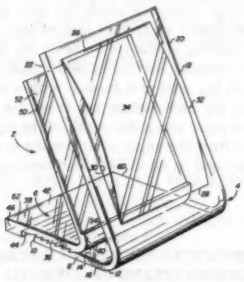
ADJUSTABLE BOOK HOLDER INCLUDING MAGNIFYING FRONT PANEL

M. Gene Nelson, 4414 N. 21st Ave., Phoenix, Ariz. 85015

Filed Jul. 12, 1982, Ser. No. 397,030

Int. Cl.³ A47B *97/00*

U.S. Cl. 248—441.1 **7 Claims**



1. A holder for supporting a book or the like in an opened position, comprising in combination:

a. a front member including a first generally horizontal base portion having front and rear ends and upper and lower surfaces, the lower surface of said base portion being adapted to engage and rest upon a generally horizontal support surface, said front member also including a first support panel portion extending upwardly and rearwardly from the front edge of said first base portion and including front and rear surfaces, the rear surface of said first support panel portion being adapted to engage the exposed pages of the opened book, said first support panel portion being substantially transparent for permitting the exposed pages of the opened book to be viewed by the user while protecting such exposed pages from foreign matter;

b. a rear member including a second generally horizontal base portion having a front and rear ends and upper and lower surfaces, the lower surface of said second base portion being adapted to rest upon the upper surface of said first base portion, said rear member also including a second support panel portion having a front surface and extending upwardly and rearwardly from the front edge of said second base portion and generally parallel to said first support panel portion for supporting the covers of the opened book; and

c. positioning means for adjustably positioning the lower surface of said second base portion at a predetermined position upon the upper surface of said first base portion to maintain said second support panel portion by a predetermined distance commensurate with the thickness of the opened book to be supported by said holder; said positioning means comprising:

a. a first toothed rack formed upon the upper surface of said first base portion; and

b. a second toothed rack formed upon the lower surface of said second base portion to releasably engage and interlock with said first toothed rack for adjustably maintaining said second support panel portion spaced apart from said first support panel portion by adjustable increments as determined by the distance between successive teeth within each of said first and second toothed racks; said first toothed rack includes a plurality of teeth directed generally toward the front end of said first base portion and said second toothed rack includes a plurality of teeth directed generally toward the rear end of said base portion to facilitate sliding motion of said rear member toward said front member while opposing sliding motion of said rear member away from said front member.

4,496,128

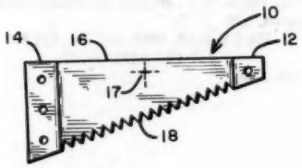
HANGING DEVICES FOR PICTURES AND THE LIKE

Verlyn N. Larsen, Sioux Falls, S. Dak., assignor to Design Concepts, Inc., Sioux Falls, S. Dak.

Filed Sep. 2, 1982, Ser. No. 414,508

Int. Cl.³ A47G *1/24*

U.S. Cl. 248—496 **7 Claims**



1. Apparatus for hanging and leveling picture frames and the like, comprising a pair of generally triangular shaped members, each such member having means for attachment to a picture frame proximate a top rear corner comprising an edge channel adapted for nesting about said frame; each member further comprising a notched edge surface along a diagonal line which is the longest edge of said triangular shape.

4,496,129

TREE STAND

George W. Waterman, East Longmeadow, and Arthur F. Dionne, Wilbraham, both of Mass., assignors to Standex International Corp., Salem, N.H.

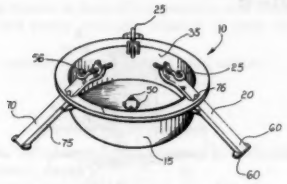
Filed Dec. 6, 1982, Ser. No. 446,947

Int. Cl.³ A47G *33/12*

U.S. Cl. 248—527 **12 Claims**

1. A tree stand comprising a bowl for receiving a tree trunk

therewithin, said bowl having a sidewall portion and a rim portion including a plurality of spaced apertures therein, said tree stand further comprising a plurality of legs extending through said apertures, said legs including inner end portions carrying means thereon for collectively clamping said tree trunk therebetween, said tree stand further comprising means extending radially inwardly from said legs and pivotally connected thereto and engaging said sidewall of said bowl, engagement of said clamping means with said tree trunk exerting outwardly directed reactive forces on the inner ends of said legs thereby pivotally urging said legs inwardly toward portions of said bowl rim portion adjacent said apertures and urging said sidewall engaging means radially inwardly into compressive engagement with said bowl at said sidewall portion thereof.



4,496,130

SUPPORT DEVICE

Jun Toyama, 4-11, Mejiro 2-Chome, Toshima-ku, Tokyo-To, Japan

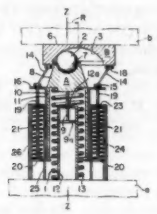
PCT No. PCT/JP82/00051, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982, PCT Pub. No. WO82/02930, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 24, 1982, Ser. No. 433,134

Claims priority, application Japan, Feb. 25, 1981, 56-25421

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—585 **10 Claims**



1. A support device constituted by having a first component disposed on the side of either one of a supporting structure and a supported structure, a second component disposed on the side of the other and provided with a concave surface, a spherical structure held by said first component and being in rollable contact with the concave surface of the second component, an elastic support mechanism elastically supporting either one of said first component and second component on a confronting support surface, a holding mechanism of the second component held in a manner to be slidable along the outer side of said first component and hinge-coupled to said second component, and a pulling mechanism for pulling said second component in one direction so that said concave surface and spherical structure will be in pressing contact.

4,496,131

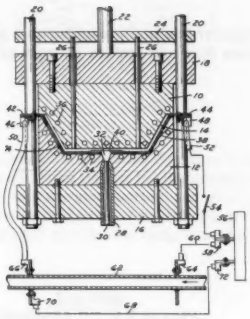
APPARATUS FOR INJECTION MOLDING A FOAMED RESIN PRODUCT HAVING A SMOOTH SURFACE INVOLVING SURFACE HEATING OF THE MOLD BY APPLYING HIGH CURRENT LOW VOLTAGE ELECTRIC POWER

Wen-Jei Yang, 3925 Waldenwood, Ann Arbor, Mich. 48104

Division of Ser. No. 337,852, Jan. 7, 1982, Pat. No. 4,390,485. This application May 25, 1983, Ser. No. 498,021

Int. Cl.³ B29F *1/08;* **B29D** *27/00*

U.S. Cl. 249—78 **20 Claims**



1. Apparatus for heating several hundred degrees Fahrenheit within a matter of seconds or less at least a portion of the interior surface of a metal mold without substantially heating the bulk of the metal mold, the apparatus comprising,

a relatively thin metallic sheet of substantially high electrical resistivity covering the portions of the metal mold surface to be heated, said metallic sheet electrically insulated from the bulk metal mold surface at the interface therebetween by a relatively thin non-structural electrically insulative coating, said electrically insulative coating providing a negligible increase in thermal resistance between the metallic sheet and the bulk metal mold,

a source of high current low voltage electric power, said metallic sheet electrically connected to the source of electric power so as to heat the metallic sheet upon the application of the electric power,

said electrically insulative coating of sufficient electrical resistivity in combination with said low voltage to cause the bulk of said high current to pass through said metallic sheet and only a small portion of said high current to pass through the bulk metal mold.

4,496,132

SLEEVE VALVE WITH INTEGRAL CONTROL CHAMBER

Zvi Weingarten, Kibbutz Evron, Mobil Post Ashrat, Israel

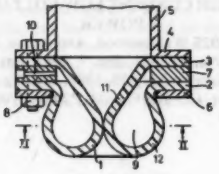
Continuation of Ser. No. 296,919, Aug. 27, 1981, abandoned. This application Dec. 2, 1982, Ser. No. 446,183

Int. Cl.³ F16K *31/385*

U.S. Cl. 251—5 **4 Claims**

1. A sleeve valve comprising a generally circular elastomer sleeve folded onto itself to define an annulus, the two peripheral ends being fixedly held and sealed with respect to each other to provide an entirely integral, expandable control chamber formed within said annulus, means providing an opening to said chamber for connection to a source of control pressure,

portions of the inner wall of the annulus closed together when said chamber is pressurized to seal the valve, said portions



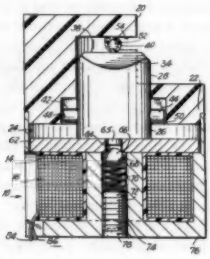
closed together at a position including a plane axially spaced downstream from any position between said peripheral ends.

4,496,133

PINCH VALVE ASSEMBLY

Akos Sule, 4 Gates Ave., Roseland, N.J. 07068

Filed Mar. 2, 1982, Ser. No. 354,053
Int. Cl.³ F16K *7/04*
U.S. Cl. 251—7 **8 Claims**



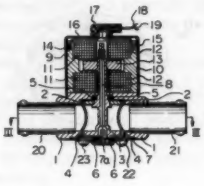
1. A pinch valve assembly comprising a valve body,
a solenoid housing mounted on said valve body,
a solenoid coil mounted in said solenoid housing with said solenoid coil having a central bore,
spring means disposed in said central bore,
armature means supported by said spring means,
a plunger member supported by said armature means,
guide means disposed on said valve body and disposed to guide said plunger relative to said valve body, with said guide means comprising a pin member projecting from the surface of said plunger and slideably disposed with respect to a slot formed in said valve body,
resilient tubing means disposed between said plunger and said valve body and with said spring means disposed to force said plunger against said tubing means and said tubing means against said valve body causing said tubing means to collapse and preventing flow through said tubing means until said solenoid coil is electrically energized, thereby drawing said armature means toward said solenoid, releasing said tubing means, and permitting flow through said tubing means.

4,496,134

ROTARY SOLENOID ACTUATOR

Takaharu Idogaki, Okazaki; Hisasi Kawai, Toyohashi; Kyo Hattori, Susono, and Kazuhiro Sakurai, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 27, 1981, Ser. No. 296,805
Claims priority, application Japan, Sep. 3, 1980, 55-122752
Int. Cl.³ F16K *31/08*
U.S. Cl. 251—65 **6 Claims**



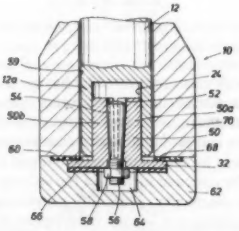
1. A rotary solenoid actuator for proportionally controlling the flow of fluid in a pipe, comprising:
a housing mounted on said pipe;
a coreless coil, attached to said housing, for generating a magnetic field in response to a control current flowing therethrough, said coreless coil having two coaxial coil sections;
a rotatable shaft disposed in a space between the coil sections of said coreless coil and having a longitudinal axis that is approximately perpendicular to the magnetic axis of said coreless coil;
a rotatable permanent magnet fixed coaxially to said rotatable shaft and disposed within said coreless coil;
a return spring having one end attached to said shaft and the other end attached to said housing; and
a valve rotor rotatably disposed within the housing, the valve rotor being fixed to said rotatable shaft and being coaxial to said rotatable permanent magnet, and wherein said rotatable shaft is a hollow shaft, and said return spring comprises a torsion bar disposed within said hollow shaft.

4,496,135

ALIGNMENT MAINTAINING APPARATUS FOR TRUNNION MOUNTED VALVES

William B. Scoble, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Continuation of Ser. No. 344,503, Feb. 1, 1982,. This application May 25, 1984, Ser. No. 614,300
Int. Cl.³ F16K *1/22*
U.S. Cl. 251—308 **13 Claims**



1. An apparauts for maintaining a trunnion mounted valve closure element in a predetermined relationship relative to a valve seat disposed in a valve body comprising:
shaft means, said shaft means being connectable to said valve

element, the end of such shaft means distal said valve element having an axial bore defining a wall;

plug means, at least a portion of which is received in said bore, said plug means having means to axially fix said plug means relative to said shaft means, said plug means being laterally expandable, said plug means having an exterior surface provided with means for preventing axial movement of said shaft means relative to said plug means when said plug means is laterally expanded said shaft and said plug means being rotatable relative to said valve body; and

means for laterally expanding said plug means.

4,496,136

HOIST

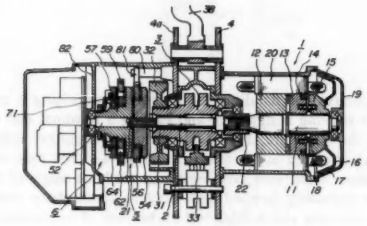
Kazuo Maeda, Yokohama, Japan, assignor to Kabushiki Kaisha Kito, Kawasaki, Japan

Filed Aug. 19, 1983, Ser. No. 524,636

Claims priority, application Japan, Aug. 25, 1982, 57-146212

Int. Cl.³ B66D *1/14;* F16D *7/00*

U.S. Cl. 254—350 **5 Claims**



1. A hoist including a shaft driven by external force, a driving shaft connected to said shaft, a reduction gear train for transmitting rotation of said driving shaft to a load sheave, and a mechanical brake assembly in said reduction gear train, said hoist comprising an overload safety device arranged in said reduction gear train, said overload safety device comprising a driven gear having a one-way clutch and rotatably driven by said driving shaft, a movable member threadedly engaged with a driven shaft of said mechanical brake assembly, a disc rotatably arranged on said movable member and carrying thereon said one-way clutch, radially inward friction plates interposed between said movable member and said disc and between said disc and a radially inward retainer member fitted axially slidably but against rotation on said movable member and radially outward friction plates arranged outwardly of said radially inward friction plates and between said driven gear and said movable member and between said driven gear and a radially outward retainer member axially slidably but against rotation on said radially inward retainer member, and resilient urging means for urging said radially inward and outward friction plates.

4,496,137

DIAPHRAGM SPRING FOR USE IN FRICTION CLUTCHES AND THE LIKE

Wolfgang Reik, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

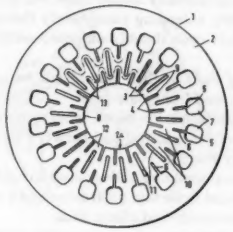
Filed Jul. 9, 1982, Ser. No. 396,805

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204621

Int. Cl.³ F16D *13/44;* F16F *1/34*

U.S. Cl. 267—161 **10 Claims**

1. A diaphragm spring having a substantially centrally located opening and comprising an annular outer marginal portion and a plurality of prongs disposed inwardly of said marginal portion and extending toward said opening, said spring further having elongated first slots disposed between said prongs and elongated second slots extending toward said opening and disposed between said first slots and said marginal portion and having enlarged portions in the region of said marginal portion, said first slots being spaced apart from said



second slots, as considered in the radial direction of said marginal portion, and said spring further having cutouts disposed radially inwardly of said marginal portion and overlying portions of said first and second slots, as considered in the radial direction of said marginal portion, and being spaced apart from said opening.

4,496,138

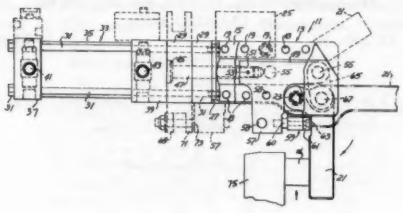
POWER OPERATED CLAMP

Leland F. Blatt, 31915 Groesbeck Hwy., Fraser, Mich. 48026

Filed Mar. 26, 1982, Ser. No. 362,512

Int. Cl.³ B23Q *3/08*

U.S. Cl. 269—32 **11 Claims**



1. In a fluid operated clamp for securing a workpiece relative to a workpiece support, including a cylinder having a reciprocal piston and connected piston rod projecting from said cylinder; a hollow body axially aligned with and connected to said cylinder and mounted upon a first support; said body being open at its top, bottom and front and including a pair of opposed spaced side plates with their one ends outturned and secured to said cylinder; said piston rod extending into said body between said side plates; a pivot bolt extending between forward portions of said side plates and secured thereto; a clamp arm at one end pivotally mounted upon said pivot bolt and in one position adapted to retainingly engage a workpiece relative to said workpiece support; and a pair of links at their one ends bearing against opposite sides of said clamp arm and pivotally connected thereto;

the improvement comprising;

a series of vertically spaced pairs of longitudinally spaced mounting holes extending through said side plates adjacent their tops and bottoms;

some of said mounting holes selectively at said tops and bottoms being adapted for registry with said first support for selective longitudinal adjustment of said body relative to said first support;

aperture spacers interposed between said side plates; a plurality of pivot bolts extending through some of said side

plate mounting holes and spacers interconnecting said side plates;

said side plates upon their interiors having a pair of opposed guide slots therein;

an elongated rod end between said side plates axially connected to said piston rod;

a pair of longitudinally spaced front and rear pivot slide pins supportably extending transversely through said rod end and at their ends slidably mounted within said side plate slots;

said pair of links at their outer ends being pivotally connected to said front slide pin;

an apertured protrusion block secured upon and extending transversely of said rod end between said side plates and outwardly thereof;

and a pre-stop spanning and secured to said side plates normally spaced from said protrusion block and spaced from and aligned with said clamp arm;

adapted for retaining engagement with said clamp arm and said protrusion block when moved to workpiece retaining position, said pre-stop limiting forward movement of said protrusion block and rod end.

4,496,139

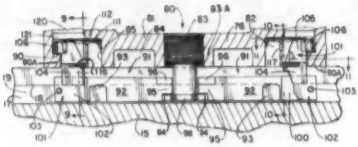
VISE CLAMP AND SWIVEL BASE VISE USING SUCH CLAMP

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Division of Ser. No. 252,286, Apr. 9, 1981, Pat. No. 4,413,819. This application Jun. 27, 1983, Ser. No. 508,340

Int. Cl.³ B23Q *3/02*

U.S. Cl. 269—81 **18 Claims**



1. In combination, a vise body adapted to be supported on a tool table having a tool slot formed in an inverted T shape, said vise body including a recess formed into the base thereof and defined by a generally cylindrical first annular surface generated around a central axis of said body, and a second surface spaced outwardly from said first annular surface and defining an outer edge of said recess, said second surface including an inturned ledge portion formed so that the ledge portion includes a surface that faces away from a tool table on which the vise is positioned, a clamp member comprising an elongated body having a head end, a remote end, and a pair of laterally extending pivot lugs between the head end and the remote end, said pivot lugs being adapted to fit within a T slot of a tool table and being retained to cause the elongated body to pivot relative to the plane of such a table when a force is placed on the remote end of the elongated body, and head means mounted on said head end and extending upwardly through such slot and into the recess formed in the base of the vise, said head means having an overhanging surface that fits over said ledge, and means mounted on said vise body adjacent the central axis and engagable with the remote end of said clamp member to exert a force tending to move said overhanging surface of said head means against the ledge to clamp the ledge against a table on which the vise body is placed.

4,496,140

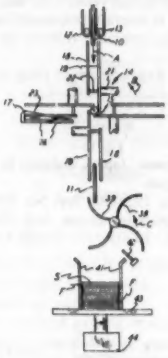
APPARATUS FOR HANDLING A SIGNATURE

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Sep. 19, 1983, Ser. No. 533,302

Int. Cl.³ B65H *39/02*

U.S. Cl. 270—54 **9 Claims**



1. Apparatus for handling a signature, comprising a conveyor for moving a signature and having a terminal end for releasing the signature, a rotatably mounted signature holder (movably) disposed adjacent said terminal end for receiving the signature from said conveyor and with an edge of the signature extending beyond said holder, a stationary cutter disposed adjacent said holder and in the path of movement of the extending edge of the signature for trimming the extending edge of the signature when the signature is rotationally moved past said cutter.

4,496,141

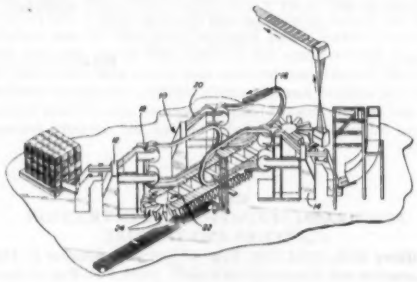
METHOD AND APPARATUS FOR OPENING FOLDED NEWSPAPERS

Pramod D. Nayate, Wheaton, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1982, Ser. No. 450,592

Int. Cl.³ B65H *5/30*

U.S. Cl. 270—55 **6 Claims**



1. A method of opening folded newspapers for a stuffer that are individually deposited into separate conveyor receptacles of the type having first and second cooperating panel members defining a pocket with a generally V-shaped cross-sectional configuration, which includes the steps of:

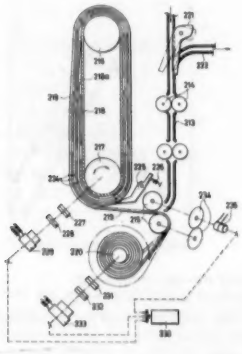
(a) moving the opposed groups of cut edges of a folded newspaper from contact with a first panel member into contact with the second panel member;

(b) applying vacuum gripping members to the exterior of the folded newspaper;
(c) pivoting the gripping vacuum members away from each other to form a center opening;
(d) pivoting a separator arm into said center opening for engaging and holding one of the groups of cut edges in contact with the second panel;
(e) discontinuing activation of said gripping member while pivoting the separator arm, and returning the other group of cut edges into contact with the first panel member.

4,496,142
SHEET SUPPLYING DEVICE FOR TWO-SIDED COPYING

Yasuo Iwasaki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,661
Claims priority, application Japan, Apr. 22, 1982, 57-66219; Aug. 28, 1982, 57-148501
Int. Cl.³ B65H *5/22*
U.S. Cl. 271—3 **16 Claims**



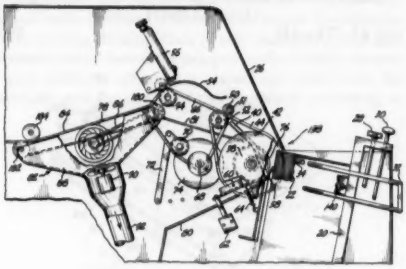
1. A sheet supplying device for two-sided copying, comprising:
a branched passage provided on the sheet discharge side of a reproduction apparatus;
sheet delivery switching means provided in said branched passage;
sheet winding belt means in one sheet delivery passage;
means for unwinding said sheet winding belt means; and
sheet conveying means for conveying a sheet unwound from said winding belt to the sheet supply side of said apparatus in a manner such that a non-recorded side of said sheet is presented for recording.

4,496,143
SHEET FEEDER

Robert K. Weyer, Mercer Island, Wash., assignor to EMF Corporation, Redmond, Wash.

Filed Jun. 1, 1982, Ser. No. 384,064
Int. Cl.³ B65H *3/64*
U.S. Cl. 271—112 **10 Claims**

1. A feed mechanism for feeding sheets seriatim from a stack of sheets comprising;
tray means for receiving a stack of sheets with said sheets positioned in a plane angled slightly from the vertical and with a top edge of said stack exposed;
feed drive wheels mounted for rotation about an axis substantially parallel to said plane; and
means to induce an air flow to pass first across the top edge of said stack and thence through said feed drive wheels whereby the top portion of the first front sheet from said stack is bendingly urged forward by said air flow into engagement with said feed drive wheels for removal of said first front sheet from said stack, said induced air flow across the top edge of said stack being temporarily and substantially interrupted by the first front sheet's full

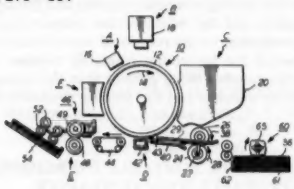


engagement with said feed drive wheels whereby the next front sheet of said stack remains quiescent until said first front sheet begins its disengagement from said feed drive wheels, thereby allowing the induced air flow to again begin to pass across the top edge of said stack.

4,496,144
PADDLE WHEEL FEEDER WITH NORMAL FORCE OPTIMIZATION AND BLADE CONTROL

William D. Perun, Webster, and Gerald M. Garavuso, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 19, 1982, Ser. No. 409,392
Int. Cl.³ B65H *3/06*
U.S. Cl. 271—114 **7 Claims**



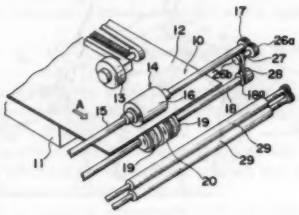
1. A paddle wheel feeder adapted to feed sheets seriatim from a stack of sheets with a diminished normal force spike, comprising:
support means for supporting a stack of sheets to be fed;
paddle wheel means supported on a shaft and having a plurality of blades positioned to sweep the top of said stack of sheets and feed sheets individually therefrom; and
control means adapted to reduce the normal force spike resulting from individual blades striking the top sheet in said stack of sheets, said control means including means for incrementally rotating said paddle wheel means to a position where each blade is immediately adjacent the top sheet in said stack of sheets, stopping the rotation momentarily as each blade of said paddle wheel means is in said position and then continuing the rotation such that the normal force produced by the sweep of said plurality of blades across said stack of sheets is less peaked and thereby reducing multifeeding of sheets.

4,496,145

SHEET FEEDING APPARATUS

Kazuyuki Fukui, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Mar. 11, 1982, Ser. No. 357,318
Claims priority, application Japan, Mar. 14, 1981, 56-38093
Int. Cl.³ B65H *3/52*
U.S. Cl. 271—122 **16 Claims**



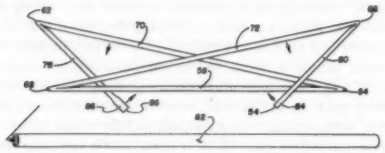
1. An automatic sheet feeding apparatus for use in a copying machine and the like which comprises: a hopper base for accommodating stack of sheet material thereon; a driven roller for feeding the sheet material in the hopper base forward one by one; a sheet separating means for receiving the sheets fed by the driven roller and separating a single uppermost sheet from other sheets below the uppermost sheet and also feeding the uppermost sheet forward; and conveyance rollers for feeding the top sheet fed by the separating means forward, said separating means comprising a feeding rotatable member which rotates in the direction of movement of the sheets to feed the single uppermost sheet forward, a separating rotatable member which contacts the feeding rotatable member and rotates in the direction opposite to the movement of sheets to prevent the sheets below the uppermost sheet from moving forward, and a follower rotatable member which contacts the feeding rotatable member and rotates together with the feeding rotatable member, said feeding rotatable member having a peripheral surface which is harder than that of the separating rotatable member, said follower rotatable member having a peripheral surface of a material having coefficient of friction smaller than that of each of the feeding rotatable member and the separating rotatable member, and the width of the contact area, in the direction perpendicular to the rotational axes of said rotatable members, between the separating rotatable member and the feeding rotatable member being greater than that between the follower rotatable member and the feeding rotatable member.

4,496,146

COMPRESSIBLE PORTABLE EXERCISING APPARATUS WITH CONTAINER

James E. Jackemeyer, 21 Cedar St., Gardner, Mass. 01440

Division of Ser. No. 130,747, Mar. 17, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,730
Int. Cl.³ A01B *5/22*
U.S. Cl. 272—74 **13 Claims**



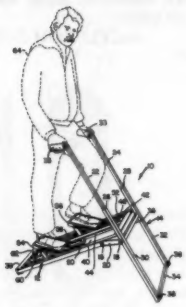
10. A portable exercise apparatus for manipulation by a user comprising: a container, a self-supporting elongated member of a generally quadrilateral configuration, said member having spaced-apart distal and proximal portions hingedly joined to side portions of equal length, said member being disjoined at opposite ends thereof, said side, distal and proximal portions being folded upon one another into a generally parallel relationship with one another to form a compressible elongated configuration, said member in said folded condition being compressed to an extent to be received within said container, and said member in said folded condition being frictionally held in said container.

4,496,147

EXERCISE STAIR DEVICE

Richard J. DeCloux, Manchester, N.H.; Herbert H. Loeffler, Arlington, Mass.; James S. MacConkey, Winchester, Mass., and E. Hubbard Yonkers, Watertown, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 12, 1982, Ser. No. 357,791
Int. Cl.³ A63B *21/00, 23/04*
U.S. Cl. 272—130 **10 Claims**



1. An exercise device comprising:

a pair of inclined side-by-side tracks;

a pair of steps, each mounted for translation in a different one of said tracks and each unrestricted in the amount of stroke during exercise, said steps being phased only hydraulically by an open loop system such that increased fluid expansion during usuage results only in the raising of the steps, thereby eliminating pressure increase due to thermal expansion, said open loop system including said steps and a pair of hydraulic actuators for respective steps, each actuator including a cylinder and a rod disposed therein, with one end of a rod supporting a respective step; means for coupling fluid from one actuator to the other such that as one rod moves in one direction within the associated cylinder, the rod in the other cylinder moves in an opposite direction, said rods in unison being permitted to extend further up each cylinder during usage in accordance with the expansion of the fluid volume in the system due to the energy introduced into the system during usage such that the thermally induced pressure within the system stays substantially contant; and, fluid metering means interposed in said coupling means and including a variable restricted orifice, the size of said orifice determining the fluid flow rate, the stepping frequency, and thus the exercise rate, whereby excercise rate may be easily adjusted.

4,496,148

SPORTING EVENT ANALYSIS DEVICE

Barry R. Morstain, 28 E. Cleveland Ave., Newark, Del. 19711, and Melvin F. Danner, Frederick, Md., assignors to Barry R. Morstain, Newark, Del.

Filed Dec. 9, 1981, Ser. No. 329,140
Int. Cl.³ A63B *71/04;* **A63F** *7/00*
U.S. Cl. 273—1 E **19 Claims**

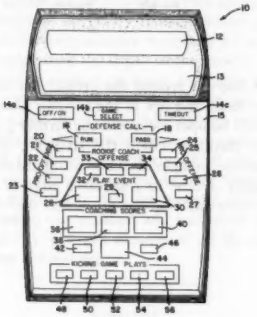
18. A sports analysis device for use by at least one user in conjunction with observation of an actual sporting event,

involving actual plays and actual teams, wherein said analysis device is utilized simultaneously with the course of the actual sporting event to analyze the effectiveness of said at least one user in choosing play strategy when compared with the team's actual plays and actual results, said actual sporting event being of a type selected from a plurality of types of events, said device comprising:

selection means actuable by said at least one user to select a play strategy choice deemed by said at least one user to be a play strategy appropriate for implementation in the actual sporting event;

memory means for memorizing each said play strategy choice selected by said at least one user;

entry means for entering into said device the actual team's actual play strategy and the quantitative empirical results of the actual play that took place in the actual sporting event, wherein the quantitative empirical results can be positive or negative numbers;



processing means for processing said play strategy choice, actual play strategy, and quantitative empirical results entered into said device by said at least one user, said processing means serving to analyze the same and to evaluate the effectiveness of said play strategy choice selected by each said at least one user by comparing the same with the actual team's actual play strategy and based upon the quantitative empirical results of the said actual play; and

display means for displaying feedback messages apprising each said at least one user of the analysis and evaluation of said effectiveness of said selected play strategy;

wherein said selection means and said entry means are implemented by a keypad scanner removably mounted on said device, said keypad scanner being removable so as to be interchangeable with another keypad scanner, whereby to convert said device from one type of sporting event to another.

4,496,149

GAME APPARATUS UTILIZING CONTROLLABLE AUDIO SIGNALS

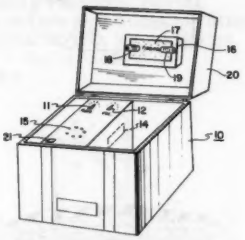
Robert B. Schwartzberg, 41 Madison Ave., Fanwood, N.J. 07023

Filed Nov. 10, 1982, Ser. No. 440,544
Int. Cl.³ A63H *5/00*
U.S. Cl. 273—1 E **5 Claims**

1. A game apparatus employing an object capable of emitting an audible signal to enable one successful player of a plurality of players to locate the object, when hidden, by responding to the sound emanating from said object, comprising:

a housing manifesting said object and having an internal hollow, said housing being of a box-like configuration with an opened top and having a cover member pivotally secured to said housing for selectively covering said opened top,

an oscillator circuit located in the hollow of said housing and operative when energized to provide an output signal manifesting a repetitive waveform of an adjustable amplitude and rate; control means positioned in said housing and coupled to said oscillator circuit to selectively adjust the amplitude and rate of said waveform wherein said control means includes a first control means for independently varying the amplitude of said oscillator circuit and a second control means for independently varying the rate of said oscillator whereby a player can select both the amplitude and frequency of the waveform according to



his preference, said oscillator providing a ramp voltage output signal where the duration between ramps is controlled by said second control means,

sound producing means responsive to said ramp output signal to produce an audible signal according to said ramp waveform, and

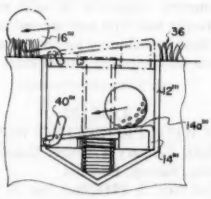
repository means located in said housing for retaining an award deposited therein by a player as an incentive to said successful player capable of locating said housing by responding to the sound emitted from said housing.

4,496,150

GOLF BALL EJECTOR FOR GOLF GREEN HOLE LINER

John J. McGlew, Box 823, Tuxedo Park, N.Y. 10987

Filed Jul. 15, 1982, Ser. No. 398,597
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—34 A **5 Claims**



1. A golf ball ejection device for use with a golf course hole liner such as used in golf course greens and putting greens, comprising a golf ball support adapted to be positioned in the liner, and means associated with said golf ball support for enabling a golf ball entering said cup to actuate a release which allows said support to be moved upwardly to eject a golf ball which has entered into the hole liner and move it out of the liner, and indicator means associated with said ball support for recording when a ball has been ejected out of the liner.

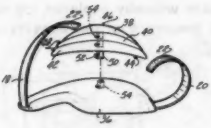
4,496,151
BOWLING AID DEVICE

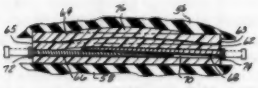
Aloysius K. Tureaud, 213 E. Washington St., Ann Arbor, Mich. 48104

Continuation-in-part of Ser. No. 302,924, Sep. 16, 1981, abandoned. This application Nov. 10, 1982, Ser. No. 440,781

Int. Cl.[3] A63B 69/00

U.S. Cl. 273—54 B 10 Claims





1. A bowling aid device, comprising:

a palm member for maintaining a preselected spacing between the palm of a bowler's hand and a bowling ball gripped by the bowler, said palm member having a first face adapted to engage said palm and having a second face adapted to conformingly engage said bowling ball,

said palm member including a plurality of discrete layers interposed between said first and second faces and means for releasably securing said layers between said first and second faces,

at least portions of the outer edges of said layers defining sections of said first face of said palm member,

whereby individual ones of said layers may be added or removed from said palm member and thereby alter the spacing between siad palm and said bowling ball.

4. A bowling aid device for maintaining a preselected spacing between the palm of a bowler's hand and a bowling ball, comprising:

a first section adapted to engage said bowler's palm;

a second section adapted to engage said bowling ball; and

means interposed between said first and second sections for altering the spacing between said first and second sections, including a member which is extensible in a direction extending between said first and second sections upon the application of compressive force on opposite lateral sides thereof, whereby extension of said member alters the spacing between said first and second sections, said altering means further including means for applying compressive force on said opposite lateral sides of said member.

4,496,152
RACQUETS WITH PROTECTIVE BUMPER STRIP

Jonathan C. Mott, Cranary Cottage, Dunsford Rd., Loxhill, Near Godalming, Surrey, England

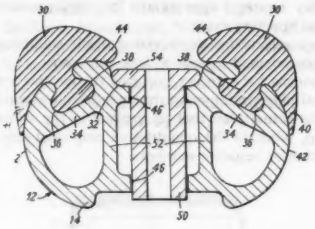
Filed Nov. 3, 1981, Ser. No. 317,773

Claims priority, application United Kingdom, Nov. 4, 1980, 8035375

Int. Cl.[3] A63B 49/14

U.S. Cl. 273—73 C 6 Claims

1. A racquet having a metal head and a handle attached to said head, the outer surface of the head having at least two grooves therein which are disposed one on each side of the median plane of the head and each extend around a substantial proportion of the circumference of the head on each side of a point opposite the attachment of the handle to the head, said grooves having a base annd mouth, each groove being wider at its base than at its mouth and having secured therein a respective relatively soft bumper member which extends over and serves to cover a substantial proportion of the outer surface of the head, each bumper member having a mounting portion shaped to substantially fill its respective groove, whereby the bumper members are locked into their respective grooves, and wherein the outer surface of the head has a further groove



therein which extends around the greater part of the circumference of the head and lies in the median plane of the head between the two bumper members, the further groove containing grommets through which the stringing of the racquet passes, at least one bumper member being shaped and dimensioned to slightly overlie its respective edge of the mouth of the further groove and trap the grommets therein.

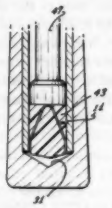
4,496,153
METHOD OF WEIGHTING AN ARTICLE

Rudolph J. Kochevar, 252 Arbolada Dr., Arcadia, Calif. 91006

Filed Jan. 10, 1984, Ser. No. 569,583

Int. Cl.[3] A63B 53/02

U.S. Cl. 273—80.8 20 Claims



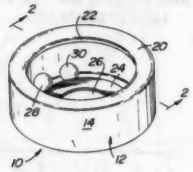
1. A method of making a weighted article comprising:

providing a member having a cavity with an anchor affixed to said member and extending within the cavity at least part way across the cavity;

placing a mass of permanently deformable weight composition into the cavity with such mass being sufficient to give the member approximately the desired weight; and

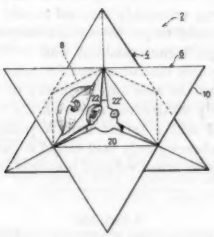
deforming the mass of weight composition in the cavity to substantially embed at least a portion of the anchor in the mass of weight composition with the mass of weight composition substantially circumscribing at least a region of the anchor to interlock the mass of weight composition and the anchor whereby the mass of weight composition is retained in the cavity.

4,496,154
WHIRLEY BALLS AMUSEMENT DEVICE
Dov Shazeer, 1425 Magee Ave., Philadelphia, Pa. 19111
Filed Aug. 10, 1982, Ser. No. 406,811
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—109 **10 Claims**



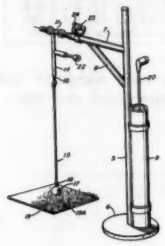
4. A device for demonstrating the principal of conservation of momentum comprising a housing having an open top and a horizontally disposed upwardly facing circular groove, said groove being defined on its outer periphery by a vertical wall substantially higher than the depth of the groove, said groove defined by a rough surface on inner and outer walls of said groove, at least two balls of hard material in said groove, said balls being of equal mass, said balls having snug fit in said groove and substantially simultaneously contacting said rough surface on both the inner and outer walls of said groove, said housing being of a size so that it can be hand-held and manipulated to cause the balls to move in opposite directions in said groove and contact one another, and said inner wall having a sufficient height to prevent movement of the balls radially inwardly during normal use.

4,496,155
HAND-MANIPULATABLE THREE-DIMENSIONAL PUZZLE
Israel Goldfarb, 206 Bnei Efraim St., Maoz Aviv, Tel-Aviv, Israel
Filed Sep. 8, 1982, Ser. No. 415,923
Claims priority, application Israel, Jan. 22, 1982, 64833
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **15 Claims**



12. A hand-manipulatable, three-dimensional puzzle including a center sphere enclosed by eight segments, one of said segments being fixed to said sphere and the others being movable over its outer face along a plurality of orbits including at least one orbit for each of three orthogonal planes, each of said plurality of segments being of congruent triangular shape and having an outer flat triangular face, all said pluality of segments together defining an octahedron-shaped body; each of said triangular segments carrying an outer element in the shape of a tetrahedron having its vertex directed outwardly, whereby said outer elements define with said octahedron-shaped body, a pair of inter-penetrating tetrahedra presenting the outline appearance of a six-pointed star whenever the device is viewed along any axis extending through the vertex of each of the eight outer tetrahedra.

4,496,156
GOLF PRACTICE DEVICE
Rocco Centafanti, 27 India St., Portland, Me. 04101
Filed Feb. 24, 1983, Ser. No. 469,229
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—184 B **1 Claim**

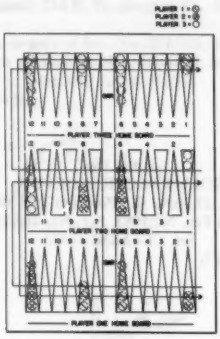


1. Apparatus for use in practicing golf ball driving with a golf ball, said apparatus including a vertical support provided with a laterally disposed arm, a counter mounted on said arm and having an actuator operated by a downward push, a rotor, means connecting said rotor to said support with the rotor axis horizontal and the rotor offset relative to the support to overlie a theoretical tee site, said rotor including a rigid member disposed normal to the axis thereof and provided with a horizontal arm disposed towards the vertical support and including a member positioned to have a path inclusive of the actuator as the rotor turns, the counter so positioned that the actuator is engaged immediately after the ball passes through the zenith of its orbit, a golf ball, a flexible tether connecting said ball to the free end of the rigid member, said rotor axis spaced from the tee site a distance such that a ball struck with driving force will have an orbital path greater than the height of the person using the apparatus, and the length of said rigid member such as both to initiate the turning of said rotor and to limit the extent to which the path of a struck ball can depart from the normal plane established by the rigid member.

4,496,157
THREE PLAYER BACKGAMMON GAMEBOARD
Claire Gilliland, 2616 Gibson, Everett, Wash. 98204
Division of Ser. No. 230,718, Feb. 2, 1981,. This application Sep. 29, 1982, Ser. No. 428,047
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—248 **5 Claims**

1. A game board especially suited for three-person play comprising a field of play including a rectangular, planar area substantially free from holes including three substantially parallel rows of twelve points each,

and a bar intersecting each of the three rows between its sixth and seventh point, the bar dividing the field into two



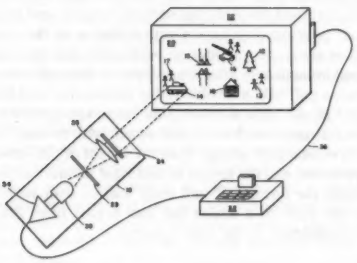
smaller rectangles each rectangle including eighteen points having six points from each row.

4,496,158

ELECTRO-OPTICAL SENSOR FOR COLOR TELEVISION GAMES AND TRAINING SYSTEMS

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 13, 1982, Ser. No. 449,069
Int. Cl.³ A63F 9/22
U.S. Cl. 273—312 **6 Claims**



1. Apparatus for sensing at a distance one or more colored symbols shown on a display from among at least one other symbol of a different color, comprising:

an electro-optical sensor disposed at a distance from a display and capable of receiving light rays from symbols representing objects shown on the display;

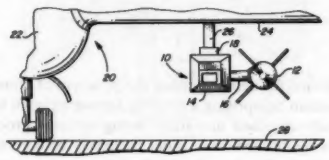
said electro-optical sensor including a photosensitive detector and only a single color filter associated therewith to limit the reception of light detected by the photosensitive detector to light from displayed symbols of predetermined colors while light from displayed symbols of other colors is not detected by the photosensitive detector, said color filter comprising an optical filter including a material which passes visible radiation of certain predetermined wavelengths and excludes visible radiation of certain other wavelengths, wherein the beam of light entering said single color filter has not been split by a beam splitter.

4,496,159

AERIAL GUNNERY TARGET DEPLOYMENT SYSTEM

Elmo A. Dugan, 8639 Hatillo Ave.; Louis G. Kish, 8542 Lurline Ave., both of Canoga Park, Calif. 91306; Edwin J. Miller, 30473 Mulholland Hwy., Space 18, Agoura, Calif. 91301, and George J. Fabian, 6640 Darby Ave., No. 11, Reseda, Calif. 91335

Filed May 24, 1983, Ser. No. 497,570
Int. Cl.³ B64D 3/02
U.S. Cl. 273—341 **6 Claims**



1. An improved aerial gunnery target and tow reel system, said system comprising, in combination:

(a) an aerial target;

(b) a housing affixable to an airframe and disposed substantially parallel to and to one side of said target, said housing and target lying, in a target stored position, outside the slipstream of the airframe;

(c) a cable spool secured for rotation in said housing, said cable spool having a towline cable wound therearound, said cable being connected to said target for towing said target;

(d) reel motive and control means in said housing for reeling and unreeling said cable from said spool; and,

(e) an improved target launcher assembly in said housing for launching said target away from said housing, said launcher assembly including:

(1) a launcher arm extending horizontally from the side of the housing, releasably secured to said target and movable with said target between a target stored position and a target launch position, and

(2) launcher arm motive means for rotating said arm and target about an axis longitudinally of said housing approximately 90 degrees downwardly between said target stored and a target launch position beneath the housing whereby only said target is outside the aircraft pressure field when rotated into said launch position.

4,496,160

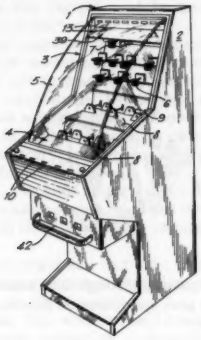
COIN PROJECTING AND TARGET GAME APPARATUS

Michael Wichinsky, and LeRoy N. Gutknecht, both of 2607 S. Highland Dr., Las Vegas, Nev. 89109

Filed Dec. 14, 1982, Ser. No. 449,742
Claims priority, application United Kingdom, Dec. 15, 1981, 8137785
Int. Cl.³ A63F 9/02
U.S. Cl. 273—369 **12 Claims**

1. A game apparatus comprising a cabinet defining a playing area, means for receiving and accepting or rejecting a playing piece such as a coin or token, means for projecting an accepted playing piece within the playing area, a plurality of shrouded sensors disposed within an upper portion of the playing area and which may be actuated by a projected playing piece and operative to cause the apparatus to register a predetermined award, and at least one shelf disposed in a lower portion of the

playing area and onto which projected playing pieces may fall after projection, said shelf being traversed by pusher means



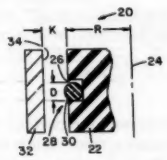
which push playing pieces collected thereon towards an edge of the shelf.

4,496,161

RADIALLY EXTENSIBLE JOINT PACKING WITH O-RING

Richard J. Fischer, Aurora, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Oct. 25, 1982, Ser. No. 436,241
Int. Cl.³ F16J *15/10, 15/56*
U.S. Cl. 277—1 **7 Claims**



7. A method for sealing between a cylindrical type bore and a piston-type member with an O-ring assembly comprising the steps of:

providing a radially extensible elastomeric body having an exterior surface portion that is substantially circular when viewed in axial cross section with an O-ring receiving, circumferential groove;

fitting an elastomeric O-ring in the groove; radially extending the body and contacting a portion of the bore while simultaneously circumferentially extending the groove and O-ring;

pressing the O-ring into sealing engagement with the cylindrical bore by means of the radially extensible elastomeric body whereby the generally piston-shaped elastomeric body provides the step of adjusting the O-ring assembly to accommodate various size cylindrical bores to the extent that there is zero clearance between the body and bore.

4,496,162

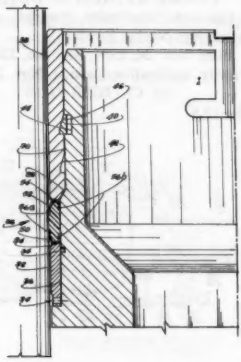
WELL SEALING ASSEMBLY HAVING RESILIENT SEAL RING WITH METAL END CAPS

James P. McEver, and James Lewandowski, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Aug. 23, 1982, Ser. No. 410,503
Int. Cl.³ F16J *15/12;* **E21B** *33/128*
U.S. Cl. 277—9.5 **4 Claims**

1. A well sealing assembly for sealing between the interior surface of a housing and the exterior of a tubular body, said tubular body having a first exterior surface, a second exterior surface which has a larger diameter than said first exterior surface and a tapered surface between said first and second surfaces, comprising

a seal ring assembly having a resilient ring with upper and lower flat surfaces, an interior convex surface and an exterior flat surface and annular metal end caps having flat portions bonded on said upper and lower flat surfaces of said resilient ring, inner legs tapering with the convex interior surface of said resilient ring and outer legs on the flat exterior surface of said resilient ring, the interior surface of said resilient ring being in close spaced relationship to said first surface of said tubular member when said seal ring assembly surrounds said first surface, and



means for moving said seal ring assembly axially from its position surrounding said first surface of said tubular member, over said tapered surface and into its set position surrounding said second surface,

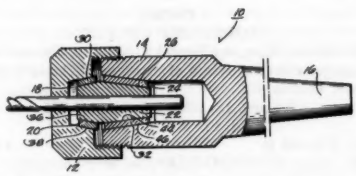
said resilient ring having sufficient resiliency and volume to expand outward when moved to said set position to seal against said interior housing surface and to move the exterior legs of said end caps into metal-to-metal sealing engagement with said interior housing surface and to seal against said second surface with said interior legs in metal-to-metal sealing engagement with said second surface.

4,496,163

ADAPTORS FOR A COLLET CHUCK

Kenneth G. Bernfeld, 5119 62nd St., Kenosha, Wis. 53142

Filed Aug. 3, 1981, Ser. No. 289,346
Int. Cl.³ B23B *5/22, 31/10, 5/00;* **B25G** *3/10*
U.S. Cl. 279—1 A **2 Claims**



1. In a collet chuck assembly including a selected collet for a pre-selected drill size and a collet nut for a collet chuck wherein the collet chuck has an inside taper which mates with the outside rearwardly extending taper of the collet and the collet nut has an inside taper which mates with the outside forwardly extending taper of the collet, the improvement comprising a set of first and second adaptor rings, each adaptor ring having an inside frusto-conical surface and an outside

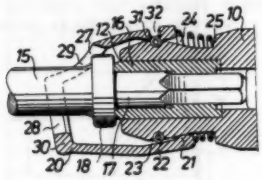
frusto-conical surface parallel to the inside frusto-conical surface, said first adaptor ring having an inside taper complementary to the outside forwardly extending taper of the collet and an outside taper complementary to the inside taper of the collet nut and said second adaptor ring having an inside taper complementary to the outside rearwardly extending taper of the collect and an outside taper complementary to the inside taper of the collet chuck and wherein said adaptor rings enable use of any of a plurality of selected collets for a wide range of pre-selected drill sizes in a single collet chuck.

4,496,164

CHISEL RETAINING DEVICE

Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 24, 1981, Ser. No. 324,436
Claims priority, application Sweden, Nov. 27, 1980, 8008307
Int. Cl.³ B23B *31/08*
U.S. Cl. 279—19.6 **5 Claims**



1. A chisel retaining device for a power operated percussion tool producing an impact in a given direction, wherein the percussion tool includes a housing (**10**) having a front end, and the chisel includes a chisel stem (**17**), the chisel retaining device comprising:

a tubular lock shell (**20**) surrounding the chisel stem (**17**) as well as the front end of the tool housing (**10**) and being pivotably supported on the tool housing (**10**) for movement between a chisel locking position and a chisel releasing position;

said lock shell (**20**) having a rear end with an internal annular shoulder (**21**) facing an impact direction of the tool;

said tool housing (**10**) having an annular peripheral groove (**23**) formed thereon;

a toroidal support spring (**22**) received in said peripheral groove (**23**) of said tool housing (**10**) for abutting cooperation with said annular shoulder (**21**);

said lock shell (**20**) having an inwardly projecting heel (**31**) which together with said annular shoulder (**21**) and said toroidal support spring (**22**) forms a pivot means for the lock shell (**20**).

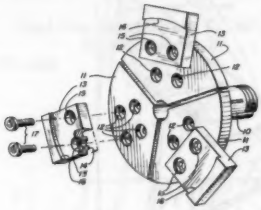
4,496,165

ADJUSTABLE COLLET

Josef Schrekeis, Niles, and Gerard P. Murphy, Chicago, both of Ill., assignors to The Board of Trustees of The University of Illinois, Urbana, Ill.

Filed Jan. 18, 1983, Ser. No. 443,856
Int. Cl.³ B23B *31/20*
U.S. Cl. 279—46 R **2 Claims**

1. An adjustable collet comprising in combination a step collet, a plurality of extension bars, and a plurality of jaws for securely holding a work-piece, the step collet face having counter-bored and threaded holes spaced thereon, the extension bars having hollow bosses projecting from one surface which are aligned with counter-bored holes on the opposite surface, and the jaws having hollow bosses projecting from one surface which are aligned with counter-bored holes on the opposite surface, the extension bars being fastened to the collet face by mating the bosses with the holes in the collet face and by engaging screws passing through the counter-bored holes and the hollow bosses to the threaded hole in the collet face, and the jaws being fastened to the extension bars by mating the jaw bosses with the counter-bored holes in the extension bars



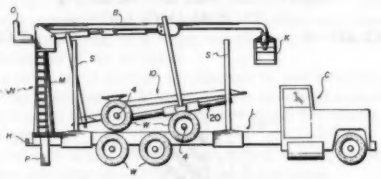
and engaging screws passing through the counter-bored and hollow bosses in both jaws and extension bars to the threaded hole in the collet face.

4,496,166

TRANSLOTOR LOG TRAILER

Clifford W. Anderson, Rte. 1, Box 205-H, Spearfish, S. Dak. 57783

Filed Mar. 23, 1982, Ser. No. 360,935
Int. Cl.³ B62D *53/06*
U.S. Cl. 280—401 **4 Claims**



1. A trailer for increasing the payload of a truck which is adapted to carry elongate articles such as logs, pipes or the like and is stored on said truck when not in use comprising, in combination:

a forward trailer segment attached to a rear portion of said truck,

a rearward trailer segment attached to a back portion of said forward trailer,

means on a trailing portion of said truck for placing first said rearward and then said forward trailer segments on and off said truck and to load and unload said truck and trailers of their payload, and means for nesting said forward trailer segment and said rearward trailer segment,

wherein said nesting means comprises a wheeled axle on said forward trailer segment and cradle members on said rearward trailer segment dimensioned to receive said forward trailer axle,

wherein said rearward trailer segment includes an axle assembly slidably and rotatably disposed about and along the length of said rearward trailer segment to respectively provide nesting clearance during storage and a rear suspension system,

wherein said rearward trailer segment axle assembly includes locking means to limit relative sliding motion when in use,

wherein said forward trailer segment includes a support means graspable by said placing means which includes a tined claw on the truck for placement of said forward trailer between a stored and used position,

wherein said forward trailer segment includes a fifth wheel extending up from an axle assembly which carries said

wheeled axle, said fifth wheel pivot thereto and adapted to attach to said rearward trailer segment,

including a support beam extending forwardly of said forward trailer axle assembly and having a latching eyelet at a leading end thereof, said latching eyelet adapted to connect to a hitch on the truck,

wherein said rearward trailer segment includes a forward fifth wheel assembly adapted to connect to said fifth wheel of said forward trailer segment, a rearwardly extending substantially cylindrical support beam upon which said axle assembly is disposed, said axle assembly and said fifth wheel supporting cross-beams transverse to said cylindrical support means having vertically extending posts to form log cradles,

wherein said locking means extends between said axle assembly to said support beam and includes a pivoted locking arm on said axle assembly engageable on a ring on said beam,

including electrical and hydraulic conduits extending rearwardly of the truck and carried on said trailers to operate respectively lights and brakes,

wherein said fifth wheel of said forward trailer includes a central bore defined by a depending cylindrical sleeve reinforced to a bottom face of said forward trailer fifth wheel,

said axle assembly of substantially inverted U shaped configuration having bearing means to fix said axle thereto,

brackets on both said U shaped axle assembly and said fifth wheel facing each other and interleaved, interconnected by axles between said brackets to provide articulation of said fifth wheel thereabout.

4,496,167
HEEL HOLDER COMBINED WITH A SKI BRAKE

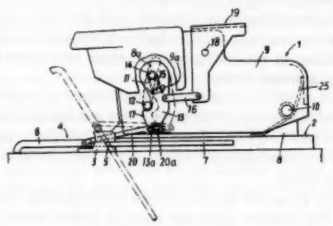
Erwin Krob, Vienna; Friedrich Leichtfried, Traiskirchen, and Helmut Bauer, Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Feb. 22, 1982, Ser. No. 350,659

Claims priority, application Austria, Feb. 20, 1981, 798/81; Mar. 13, 1981, 1187/81

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **29 Claims**



1. A heel holder for a ski binding which is adapted to releasably hold a ski boot on a ski, comprising a ski brake, a bearing block supported on a base plate which can be secured on the ski, and a housing which is supported on said bearing block for pivotal movement about a transverse axis, said housing having sole down-holding means thereon, being biased by a torsion spring, and being releasably held in a skiing position approximately parallel to an upper side of the ski by means which includes at least one locking lever which is biased by a locking spring, said ski brake having braking mandrels which are supported for pivotal movement about a transverse pivot axis on said base plate, having a stepping plate, and being operationally connected by a coupling member to said locking lever; wherein said coupling member is a linking rod which is pivotally supported at one end on said ski brake and is pivotally supported at its other end on an end of said locking lever; wherein said linking rod is pivotally supported on a half of said stepping plate which is adjacent said pivot axis of said braking mandrels of said ski brake.

4,496,168
CURRENT SUPPLY CIRCUIT FOR ELECTRONIC SAFETY SKI BINDINGS

Nicholas F. D'Antonio, Liverpool, N.Y.; Walter Knabel, Farchant, and Lorenz Stempfhuber, Garmisch-Partenkirchen, both of Fed. Rep. of Germany, assignors to Marker-Patentverwertungsgesellschaft mbH, Baar, Switzerland and Kinetronic Industries, Inc., Media, Pa.

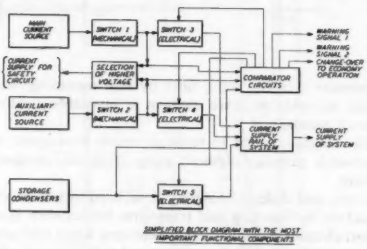
PCT No. PCT/EP81/00138, § 371 Date Apr. 22, 1982, § 102(e) Date Apr. 22, 1982, PCT Pub. No. WO82/00594, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 25, 1981, Ser. No. 373,506

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 3031981

Int. Cl.³ A63C *9/085*

U.S. Cl. 280—612 **14 Claims**



SIMPLIFIED BLOCK DIAGRAM WITH THE MOST IMPORTANT FUNCTIONAL COMPONENTS

1. A power supply system for release circuitry of an electronic ski binding, said system comprising:

a first electrical source including a first battery electrically connectable to said release circuitry;

a second electrical source including a second battery electrically connectable to said release circuitry;

switching means including first switching means connected to said first and second electrical sources, said first switching means being actuable for alternately connecting one of said sources to said release circuitry and the remaining non-connected electrical source(s) being isolated from the connected electrical source, and second switching means for actuating said first switching means in response to selection signals; and

comparison means electrically connected to said electrical sources and to said second switching means for continuously monitoring the electrical potentials of said electrical sources and for generating selection signals indicative of the one of said electrical sources having the highest electrical potential, the potentials of said electrical sources defining a floating reference valve as a basis for the generation of said selection signals; said second switching means actuating said first switching means to connect the one of said electrical sources having the highest electrical potential to said release circuitry in response to the generation of said selection signals.

4,496,169
STEP-IN SKI BINDING

Georges P. J. Salomon, Annecy, and Jacques Quellais, Saint-Jorioz, both of France, assignors to Salomon S.A., Annecy, France

Filed Jan. 7, 1982, Ser. No. 337,824

Claims priority, application France, Jan. 13, 1981, 81 00836

Int. Cl.³ A63C *9/10*

U.S. Cl. 280—615 **21 Claims**

1. Step-in binding for securing a ski shoe or boot onto a ski, wherein said boot comprises a latching element having a trans-

verse bit across and in front of said shoe or boot, said binding comprising:

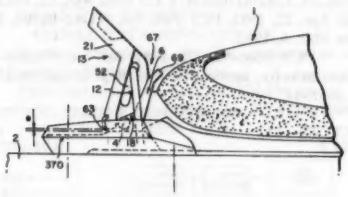
(a) a support element adapted to be mounted on a ski;

(b) a movable latch adapted to be secured to said ski, said latch comprising a movable pressure element;

(c) means for biasing said movable pressure element towards said support element when said boot is unsecured to said binding, wherein said biasing means comprises:

a mounting comprising a transverse mounting bit extending through a slot in said movable pressure element;

pivot means adapted to be mounted on said ski, said movable



pressure element being held by said mounting whereby said movable pressure element is pivotable around said pivot means; and

elastic means adapted to resist pivotable movement of said movable pressure element away from said support element,

whereby said shoe or boot may be secured by said binding to said ski by inserting said transverse bit between said support element and said pressure element when said movable pressure element is biased toward said support element and lowering said transverse bit between said movable pressure element and said support element.

4,496,170

SEAT BELT DEVICE FOR VEHICLES

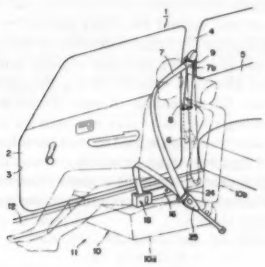
Kiichi Sasaki; Tateo Kawade, and Seiichiro Nemoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 425,052

Claims priority, application Japan, Sep. 30, 1981, 56-145194[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **15 Claims**



1. A three-way seat belt device for a vehicle having a body provided with a pillar and a side wall, the combination of: a retractor mounted on the pillar, a seat belt connected at one end thereof to said retractor, an anchor member pivotally mounted at one end thereof on said body for swinging motion, means connecting the other end of said seat belt to the swinging end of said anchor member, a detachable catch mechanism provided substantially in the center of the width of the body, releasable means for fastening said belt by engaging a part thereof with said catch mechanism and means for locking said anchor member in a forward position substantially parallel to the side wall of said body and substantially horizontal for using the seat belt.

4,496,171

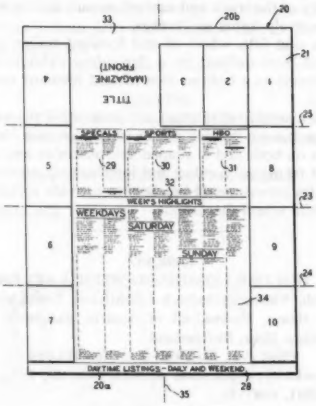
MEDIA GUIDE

Martin Cherry, 550 E. Grand Ave., Beloit, Wis. 53511

Filed Sep. 29, 1982, Ser. No. 426,610

Int. Cl.³ B42B *15/00*; G09B *29/04*; G09F *9/00*

U.S. Cl. 283—61 **9 Claims**



9. A self-indexing television program guide and advertising medium comprising in combination:

a sheet containing programming areas and advertising areas on a front surface and on a back surface and provided with foldlines in predetermined locations interrelated to said programming areas;

a first laterally extending foldline located a small distance about the center of the sheet to leave a laterally extending third indexing strip at the lower edge of the back surface and accommodating folding of the back surfaces toward each other;

a second program about a second indexing strip exposed on the first surface when the sheet is folded about said first foldline;

a third program printed on said back surface about the third indexing strip;

second and third laterally extending foldlines located slightly about the center of the sheet when folded about the first foldline and lying together when the sheet is folded about the first foldline and leaving exposed the laterally extending third indexing strip at the lower edge of the front surface when the sheet is folded about said foldlines;

a first program on the portion of the front surface exposed when the sheet is folded about said first, second and third foldlines, said programs interrelated so that a user moves from said first to said second to said third programs for progressively detailed programming information; and

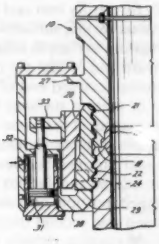
advertising information printed adjacent said programs for exposure of a user of said information with folding change for each of the programs.

4,496,172

SUBSEA WELLHEAD CONNECTORS

James M. Walker, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.

Filed Nov. 2, 1982, Ser. No. 438,601
Int. Cl.³ F16L 55/00, 37/00, 39/00
U.S. Cl. 285—18 37 Claims



1. A remotely operable, subsea wellhead connector, comprising a first tubular member adapted to be connected to the upper end of a first wellhead member mounted in an upright position beneath the water surface, a second tubular member adapted to be connected to the lower end of a second wellhead member so that it may be lowered therewith into end-to-end relation with the first tubular member, said first tubular member having first locking grooves thereabout, said second tubular member having second locking grooves thereabout, a split lock ring having first and second axially spaced locking teeth which are carried by the second tubular member for radial movement together between expanded positions in which the second teeth are generally opposite and spaced from the second grooves and in which the first teeth may be moved past the end of the first tubular member for disposal opposite and spaced from the first grooves, when said second member is lowered into end-to-end relation with the first member, and contracted positions in which the first and second teeth are in locking engagement with the first and second grooves, respectively, said teeth having tapered surfaces thereon which are slidable over tapered surfaces of the grooves to urge end surfaces on said members into tight engagement with one another as the lock ring moves to contracted position, a cam ring arranged about the lock ring for movement between a first position in which the lock ring is expanded and a second position in which the cam ring is slidable over follower means on the lock ring to wedge said lock ring into contracted position, a plurality of remotely operable, extendible and retractible actuators arranged about the cam ring, and means connecting opposite ends of the actuators to the second tubular member and the cam ring for moving said cam ring between said positions.

4,496,173

THREADED COUPLING

Joseph R. Roche; Charles D. Morrill, and Joseph H. Hynes, all of Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 182,120, Aug. 28, 1980, abandoned. This application May 10, 1983, Ser. No. 493,422
Int. Cl.³ F16L 35/00
U.S. Cl. 285—24 34 Claims

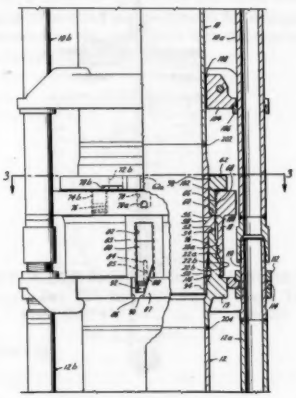
1. A coupling adapted for releasably securing vertically disposed first and second relatively large diameter pipe sections with a circumferentially uniform distributed preload, comprising:

(a) end portions on the first and second pipe sections which are shaped and dimensioned so that the end portion of the first pipe section is telescopically positionable in the end portion of the second pipe section, and first and second shoulder means on the outer surface of the first pipe section, the second shoulder means for limiting telescopic positioning of the first pipe section relative to the second pipe section;

(b) the outer surface of the end of the second pipe section disposed adjacent to the first section including at least a first set of continuous helical spin-up threads extending substantially continuously about the circumference of said outer surface;

(c) a union box rotatably mounted to the first section, the inner surface of the union box including at least a first set of continuous helical spin-up threads interengaged with the set of threads on the second pipe section for releasably securing the union box to said second pipe section by substantially continuous spin-up thread engagement, the union box further including an additional set of helical power threads;

(d) a power ring located around the first pipe section and



including a set of helical power threads interengaged with the helical power threads formed on the union box for operably securing the power ring to the union box in a predetermined axial relationship, said interengaged helical power threads extending substantially continuously about the circumference of said power ring;

(e) the power ring operably engaging the first shoulder means of the first pipe section for applying a predetermined circumferentially uniform distributed preload force to the coupling connection when the power threads are interengaged an additional increment after make-up of said helical spin-up threads and for preventing the pipe sections from moving axially apart relative to each other; and

(f) sealing means for providing a fluid tight seal between the first and second pipe sections to prevent leakage of fluid therebetween.

4,496,174

INSULATED DRILL COLLAR GAP SUB ASSEMBLY FOR A TOROIDAL COUPLED TELEMETRY SYSTEM

William J. McDonald; William C. Maurer, and David D. Nagel, all of Houston, Tex., assignors to Tele-Drill, Inc., Richardson, Tex.

Filed Jan. 30, 1981, Ser. No. 229,800
Int. Cl.³ F16L 11/12
U.S. Cl. 285—53 13 Claims

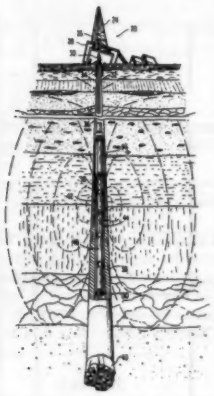
13. An insulated drill collar gap sub for a toroidal coupled telementary system comprising:

a first annular sub member operable to be connected at one end to a drill collar and form a part of the drill collar, said first annular sub member having an interconnecting structure formed at the other end thereof;

a second annular sub member operable to form a part of a drill collar sub,

said second annular sub member having an interconnecting structure formed at one end thereof operable to structurally cooperate and interengage with said interconnecting structure formed at the other end of said first annular sub member;

said interconnecting structure formed at the other end of said first annular sub member and said interconnecting structure formed at said one end of said second annular sub member being dimensioned to be mutually contiguous but spaced when said first annular member is structurally interengaged and extending to longitudinally interfere with said second annular member while simultaneously forming a generally uniform space between said first and second annular sub members;



dielectric material positioned within and occupying the void of said generally uniform spacing between the intergaged surfaces of said first annular sub member and said second annular sub member to form a connection of structural integrity and concomitant electrical isolation;

said interconnecting structure of said first and second annular sub members comprises sinusoidal-shaped, thread-like structures which structurally interengage; and

bearing means, coated with a dielectric, positioned between said first annular sub member and said second annular sub member to cooperate with said interconnecting structure of said first annular sub member and said second annular sub member to form a load bearing, insulated drill collar sub of enhanced structural integrity.

4,496,175

HYDRIL-TYPE CONNECTOR

James B. N. Morris, 22 Colony Rd., Gretna, La. 70053

Division of Ser. No. 736,492, Oct. 28, 1976, Pat. No. 4,085,951.
This application Jan. 23, 1978, Ser. No. 871,336
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—334 **7 Claims**

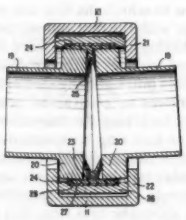
1. A damaged but repaired oil well pipe joint for interconnecting a pair of pipes, suitable to operate in an environment of high pressure differential, said joint comprising coaxial pin and box members respectively including interengaged external and internal first threads, and interengaged external and internal second threads, said first threads on said pin member being adjacent the free terminal forward end of said pin member and being of smaller outer diameter than said second threads, said threads holding the pipes against separation, said first threads and said second threads having substantially the same pitch and outline characteristics, said pin member being screwed about its axis longitudinally forwardly into said box member, at least one pair of metal-to-metal seating surfaces on said pin and box members, wherein a seating surface is located at or adjacent the free terminal forward end of said pin member and/or at or adjacent the free terminal forward end of said box member, said at least one pair of seating surfaces being sealingly interengageable when undamaged, at least one seating surface being damaged, an annular pin member shoulder area providing a stepped portion on said pin member between said first threads and said second threads, an annular box member shoulder area providing a stepped portion on said box member between said first threads and said second threads, a shoulder area having an annular recess opening radially outwardly and extending about said shoulder area, and an annularly continuous ring of relatively rigid, internally tenacious plastic or rubber material received in said recess and compressed by and between said pin member and said box member when said joint is made up to form the primary high pressure seal of said joint to seal the interior of said pipe from the exterior of said pipe.

4,496,176

DEVICE FOR CONNECTING FLANGED PIPES

Karl Weinhold, Im Jagdfeld 43, 4040 Neuss, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,801
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149833
Int. Cl.³ F16L *17/00, 23/00*
U.S. Cl. 285—365 **19 Claims**



1. A device for connecting the ends of two pipes wherein each of said ends is provided with an annular collar having a front face at an end of the pipe, a rear face spaced axially from said front face and a peripheral surface between the front and rear faces thereof, comprising:

a clamp having at least two sections, each section of said clamp including a radially inwardly projecting flange at each axial end thereof for engaging the rear surfaces of said collars when the ends of said pipes are placed adjacent each other;

an annular elastic inner profiled member having a pair of sealing lips for contacting the front faces of said collars, said inner profiled member being disposed between the front faces of said collars and forming an approximately V-shaped cross-section extending radially inward; and

an outer annular member surrounding the peripheral surfaces of said collars and being attached to said inner profiled member, said outer annular member extending axially to the radially inwardly projecting flanges of said clamp thereby substantially preventing axial movement of said inner profiled member with respect to said clamp

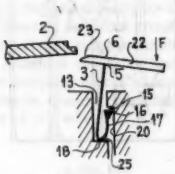
regardless of the relative deflection of said collars from a co-axial position.

4,496,177

LATCH FOR THE CLOSURE PANEL OF A UNIT SUCH AS A CASSETTE READER AND A UNIT FITTED WITH SAID LATCH

Guy Pissot, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Jun. 25, 1982, Ser. No. 391,991
Claims priority, application France, Jun. 26, 1981, 81 12609
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—87 **11 Claims**



1. A cassette reader unit having a unit body, a closure panel and a latch for said closure panel, wherein said latch comprises:

a locking head;

a latch body attached to said locking head;

an arm attached to said latch body and including snap action engagement means for retaining said arm in a recess of said unit body; and

a flexible connecting member joining said arm to said latch body; and

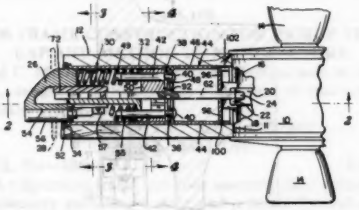
wherein said connecting member is constructed such that flexural deformation of said connecting member permits the pivoting of the latch body for the operation of the latch and permits the introduction of a part of said latch body, said connecting member and the arm in said recess of said unit body.

4,496,178

EXTENDED LATCH TUBE ASSEMBLY

Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Sep. 3, 1982, Ser. No. 414,826
The portion of the term of this patent subsequent to Mar. 9, 1997, has been disclaimed.
Int. Cl.³ E05C *1/12*; E05B *9/00*
U.S. Cl. 292—169.13 **24 Claims**



1. An extended latch tube assembly for operative interconnection with a chassis and a retractor of a cylindrical lock mounted at a backset position in a door, comprising

a latch tube having an outer and an inner end and having a substantially closed end wall,

bolt means including a latch bolt and auxiliary bolt mounted for movement axially of said latch tube at the outer and thereof,

first tailpiece guide means at the inner end of said latch tube,

a latch tube extension having an outer and an inner end, a substantially closed end wall, and means at its inner end for interconnection with the chassis of the cylindrical lock, the closed end walls of the latch tube and of the latch tube extension being securely fastened together to rigidly and permanently fix the latch tube and the latch tube extension to one another in axial alignment so that the fastened latch tube and latch tube extension cannot be disassembled, and

tailpiece means for connecting the bolt means for retraction by the retractor of the cylindrical lock chassis,

said tailpiece means including a forward portion connected for retracting the bolt and guided by the bolt and by said guide means in said latch tube for movement axially of the latch tube,

said tailpiece means also including a rearward portion extending to the inner end of the latch tube extension and having a connecting means thereon for engagement with the retractor of the cylindrical lock for retraction movement thereby to retract the bolt.

4,496,179

APPARATUS FOR MOVING ROLLED SHEET GOODS

Terry B. Ogle, Rte. 115, Box 408, Pigeon Forge, Tenn. 37863

Filed Dec. 14, 1982, Ser. No. 449,598
Int. Cl.³ B65G *7/12*
U.S. Cl. 294—26 **6 Claims**

1. An apparatus for assisting a worker in moving a roll of sheet goods such as a roll of carpet having opposite end portions, such sheet goods being rolled upon a centrally disposed cylindrical tube defining an interior surface and which forms the core of the sheet goods roll, said tube having opposite end portions, which comprises:

a handle,

a cylindrical roll engaging member having a first end portion and a further end portion and being proportioned for being received within an end portion of such tube, said roll engaging member including means at said further end portion for frictionally engaging such interior surface to prevent said roll engaging member from inadvertently disengaging from said roll during moving operations, and

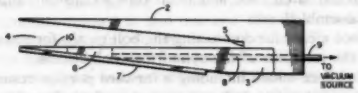
means for joining said handle and said first end of said roll engaging member, said means for joining said handle and said roll engaging member having an adjustable length such that such worker can position said handle at a preselected distance from said roll engaging member thereby enhancing the comfort and ease of movement of such worker during such moving operation while said roll engaging member is frictionally engaged with such interior surface of such tube.

4,496,180

VACUUM HANDLING APPARATUS

Joseph T. Hillman, Cincinnati, and Michael B. Miller, Milford, both of Ohio, assignors to Cincinnati Milacron Industries, Inc., Cincinnati, Ohio

Filed Jul. 20, 1983, Ser. No. 515,573
Int. Cl.³ B66C *1/02*
U.S. Cl. 294—64 R **7 Claims**



1. An apparatus for releasably grasping a thin solid article comprising in fixed relation to each other a rigid upper arm and a rigid lower arm each arm having a forward end and a rear end, wherein the upper arm and the lower arm are rigidly joined together at their rear ends to define a closed end gap therebetween having two open sides and an open forward end for receiving said article and the lower arm having a port that communicates with the gap and with an enclosed passageway for connection to a vacuum source for releasably grasping said article.

4,496,181

METHOD AND A DEVICE FOR LIFTING AND LOWERING OF A LOAD

Otto Byding, Granvägen, and Rolf Ströberg, Lågangsjövägen, both of Sweden, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 7, 1982, Ser. No. 366,440
Claims priority, application Sweden, May 7, 1981, 8102854
Int. Cl.³ B66C *1/14*
U.S. Cl. 294—78 R **7 Claims**

1. A method of moving a load by a lifting device, the load having a weight supporting member attached thereto, comprising the steps of:

attaching a guiding wire element of a strength insufficient to carry the load to the weight supporting member;

sliding a guide member, which is connected to the lifting device and slidably joined to the guiding wire element, to the weight-supporting member; and

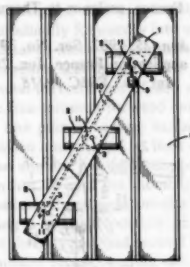
maneuvering the guiding wire for engaging the guide member with the weight-supporting member in a locked position and for disengaging the guide member from the weight supporting member in an unlocking position.

4,496,182

GRIPPER SYSTEM FOR LOAD TRANSPORT

Friedrich Krieger, Würzburg, Fed. Rep. of Germany, assignor to Gg. Noell GmbH, Würzburg, Fed. Rep. of Germany

Filed Oct. 13, 1982, Ser. No. 433,884
Int. Cl.³ B66C *1/64*
U.S. Cl. 294—81 R **9 Claims**



1. A gripper system for industrial transporting comprising:

a lifting mechanism;

support means attached to the lifting mechanism; a plurality of gripper support members each rotatable around an about vertical axis and attached to the bottom side of the support means;

a gripper element including clamping jaws where the clamping surfaces are disposed about vertical and where the claws are open at the bottom such as to grip from above and where a gripper element is rigidly attached to each gripper support member; and

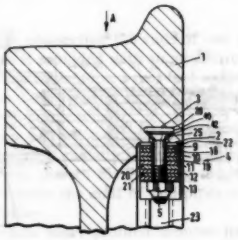
a linkage mechanism connected to the gripper support members for synchronizing the angular position of the gripper support members relative to a plurality of objects.

4,496,183

VIBRATION-DAMPED WHEEL FOR RAIL VEHICLES

Willi Kasper; Helmut Licht, both of Bochum; Erwin Raquet, Witten, and Jürgen Schneider, Bochum, all of Fed. Rep. of Germany, assignors to Krupp Stahl Aktiengesellschaft, Bochum, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,468
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033246
Int. Cl.³ B60B *17/00, 19/00*; F16F *15/10*
U.S. Cl. 295—7 **20 Claims**



1. A vibration-damped wheel, comprising:

a wheel body formed with an abutment forming recess and having a continuous circumferential undercut groove in the rim of the rail wheel having greater width at the interior bottom of the groove than at the top;

said groove being concentric with the wheel body axis;

at least one vibration-damping block element for connection

to said undercut groove distributed over the length of said groove; and

screw means having their heads inserted in the groove for securely spacing and directly connecting said undercut groove thereof.

12. A vibration-damped wheel comprising:

a wheel body formed with an abutment-forming recess having one continuous circumferential undercut groove of V-cross-section formed therein concentric with the wheel body axis;

several vibration-damping blocks for connection to said undercut groove at selectable circumferential locations so that wheel imbalances are eliminated; and

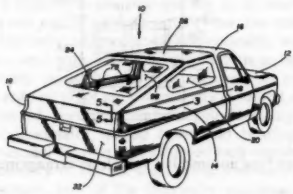
screw means having heads inserted and held in said groove for securely spacing and directly connecting said damping blocks directly to said undercut groove of said wheel with said connecting means being lockable thereto at said circumferential locations of said wheel while maintaining said vibration-damping blocks external of said undercut groove to mitigate tension concentration caused by heat and expansion of the wheel.

4,496,184

TRUCK CAP

David A. Byrd, R.R. 1, Box 111, and Max R. Byrd, R.R. 1, Box 110A, both of Craigville, Ind. 46731

Filed Mar. 14, 1983, Ser. No. 474,871
Int. Cl.³ B60P 7/02
U.S. Cl. 296—100 **30 Claims**



1. A truck cap comprising:

a plurality of frame members, said frame members being repeatedly detachably connectable to each other to form a frame, said frame having a top portion and a base portion, said top portion being resilient, said base portion being relatively rigid, and a flexible cover disposable over said frame, said cover being detachably connectable to said base portion of said frame, said cover being tensioned by said top portion of said frame to maintain said cover in a predetermined configuration.

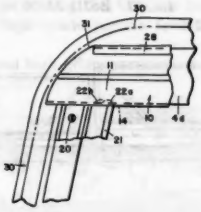
4,496,185

DOOR FRAME CONSTRUCTION FOR PICKUP TRUCK CAP AND METHOD OF MANUFACTURE

Donald C. McGaughey, and Bruce R. Bostian, both of Bristol, Ind., assignors to State Wide Aluminum of Indiana, Inc., Elkhart, Ind.

Filed Sep. 29, 1982, Ser. No. 427,877
Int. Cl.³ B60J 1/00
U.S. Cl. 296—106 **5 Claims**

3. A trapezoidal frame and door assembly for a vehicle cap, said assembly including a door and a frame formed of two opposed side frame members inclined upwardly toward each other and terminating at an extruded top frame member, said top frame member having a plate-like part having a first surface adapted to abut against and be secured to the horizontal frame member of said cap, said plate-like part having a second surface on the opposite side thereof and located on a plane, a projection extending from said second surface; said projection including a channel for slideably receiving said hinge part of said door whereby when assembled said door hinge part is slid lengthwise in said channel and is supported thereby; the improvement comprising: said projection of said top frame member at the extreme ends thereof having a severed edge perpendicular to the plane of said second surface, said plate like part



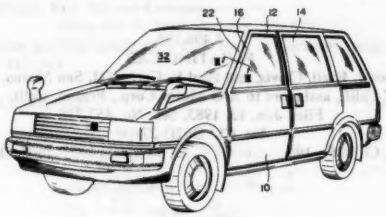
adjacent said severed edge of said channel being cut to produce arcuate-shaped ends; and said severed edges of said projection terminating short of the arcuate-shaped ends.

4,496,186

SEALING STRUCTURE FOR AN AUTOMOTIVE VEHICLE

Yoshimasa Tuchiya, Ebina; Takayo Chikaraishi, Kawasaki, and Kazunori Kawamo, Atsugi, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Nissan Shatai Company, Limited, Hiratsuka, both of, Japan

Filed Aug. 18, 1983, Ser. No. 524,349
Claims priority, application Japan, Aug. 21, 1982, 57-145354
Int. Cl.³ B60J 5/02
U.S. Cl. 296—146 **10 Claims**



1. A sealing structure for the automotive vehicle comprising:

first and second members of a vehicle body having edges opposing each other with a clearance therebetween, said first and second members having outer surfaces arranged to form substantially smooth vehicle body surface and defining an internal space extending from said clearance;

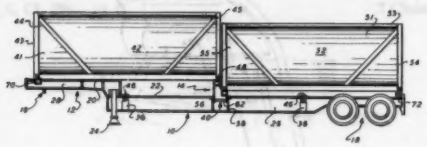
a weatherstrip disposed within said internal space and secured to one of said first and second members and having a sealing lip portion sealingly contacting the other of said members so as to establish water-tight seal therebetween; and

an elastically deformable extension integral with said weatherstrip and extending towards said clearance so that said extension elastically contacts said edges of both of said first and second members to establish a seal therebetween, part of the surface of said extension lying approximately in alignment with said outer surfaces of said first and second member.

4,496,187
TRAILER CONSTRUCTION

John J. Pontecorvo, 11 McCampbell Rd., Holmdel, N.J. 07733

Filed Dec. 28, 1982, Ser. No. 454,169
Int. Cl.[3] B62D 27/06
U.S. Cl. 296—182 10 Claims



1. A trailer construction for transporting a pair of intermodular containers, comprising:

(a) a front section having a hitch means for attaching the trailer to a towing vehicle, and a longitudinal generally horizontally aligned upper deck portion;

(b) a drop frame section extending rearwardly of the front section, said drop frame section including ground engageable support wheels and having a longitudinal generally horizontal lower deck portion, wherein the lower deck is a distance below the said upper deck;

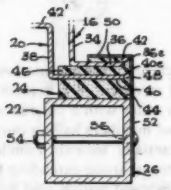
(c) pedestal means mounted on said drop frame section, said means being movable between first and second positions, said pedestal means in said first position including first support means above said lower deck portion for supporting the rear end of a first said container to maintain said container substantially horizontal when the front end of the container is supported on said upper deck, and in said second position being substantially flush with said lower deck portion, permitting carrying of a single container which is entirely positioned upon said lower deck portion; and

(d) the lower deck portion extending rearwardly of said pedestal means, being of at least sufficient length to carry a second container thereupon, the front end of which is supported at said pedestal means.

4,496,188
FLOATING CAB

James J. Ezell, Clovis, and Paul V. Garin, III, San Mateo, both of Calif., assignors to A G Motor Corp., Fresno, Calif.

Filed Jan. 13, 1983, Ser. No. 457,725
Int. Cl.[3] B62D 27/04
U.S. Cl. 296—190 3 Claims



1. In a vehicle with a metal chassis, the improvement of a vehicle cab comprising:

a plastic molded cab housing having largely vertical side walls and a largely horizontally-extending flange at the bottom of the side walls;

a metal frame lying under said cab housing flange, for coupling to said vehicle chassis;

a spacer formed of resilient material, and having a top wall lying over said cab housing flange, a bottom wall lying between said frame and said flange, and a connecting wall connecting said top and bottom walls and lying beside the edge of said flange;

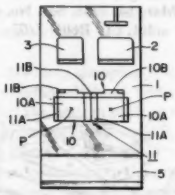
a metal clamp which includes a top part lying on top of said spacer top wall, and a side part with an upper portion lying against said connecting wall on a side thereof which is opposite said flange edge and a lower portion which lies against said frame, said clamp closely surrounding said connecting wall of said resilient spacer to resist sideward shifting of the cab, but said clamp being substantially free of direct contact with said cab flange; and

a plurality of fasteners which fasten said clamp to said frame.

4,496,189
SEAT DEVICE

Hiroyuki Tanizaki; Sakae Ebihara, both of Yokohama; Akimitsu Hatanaka, Aichi; Takayoshi Ogawa, Ogaki, and Yuzo Kanazawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama; Aichi Machine Industry Company, Limited, Nagoya and Ikeda Bussan Company Limited, Yokohama, all of, Japan

Filed Aug. 20, 1982, Ser. No. 409,879
Claims priority, application Japan, Aug. 22, 1981, 56-131885
Int. Cl.[3] A47C 13/00
U.S. Cl. 297—63 5 Claims



1. In a van type automotive vehicle an arrangement comprising:

a vehicle compartment;

a floor formed in the bottom of the vehicle compartment;

a driver seat arranged at a front portion of the vehicle compartment on the floor;

a rear seat arranged on the floor at a rear portion of the vehicle compartment;

two seat devices adjacently arranged side by-side in an intermediate position between the driver seat and the rear seat in the vehicle compartment;

each seat device including:

a main seat portion pivotally mounted about a vertical axis to be selectively set in a forward facing position or a rearward facing position thereof by turning it about said axis;

a main seat back portion projecting upwardly from a rear edge portion of the main seat portion;

a pair of auxiliary seat portions attached to both sides of the main seat portion,

the auxiliary seat portions being movable between an extended position and an unextended position in such a manner that, when the auxiliary seat portions are in the extended position, the auxiliary seat portions extend laterally from each main seat portion, said auxiliary seat portions thereby forming a continuous generally planar seat portion in combination with said main seat portions, and when the auxiliary seat portions are in the unextended position, the auxiliary seat portions do not substantially protrude from the main seat portion;

a pair of auxiliary seat back portions attached to both sides of the main seat back portion,

the auxiliary seat back portions being movable between an extended position and an unextended position in such a manner that, when the auxiliary seat back portions are in the extended position, the auxiliary seat back portions extend laterally from each main seat back portion, said

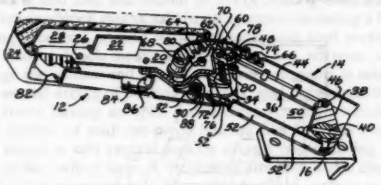
auxiliary seat back portions thereby forming a continuous generally planar seat back portion in combination with said main seat back portions, and when the auxiliary seat back portions are in the unextended position, the auxiliary seat back portions do not substantially protrude from the main seat back portion.

4,496,190

PARALLEL FOLDING ARMREST

Geoffrey W. Barley, Brookfield, Wis., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 10, 1983, Ser. No. 465,238
Int. Cl.³ A47C 7/54
U.S. Cl. 297—411 **11 Claims**



1. A height-adjustable parallel folding armrest assembly for a seat comprising an elongated hollow support housing structure having a transverse bearing opening at its rearward end for receiving one end of a round support bar, the other end of the support bar being adapted to be non-rotatably mounted to the frame of a seat with which the assembly is to be used; an armrest member pivotally mounted adjacent its lower rear corner to an armrest pivot pin transversely mounted at a lower, generally forward, portion of said elongated housing structure which is longitudinally spaced from said bearing opening which receives said support bar; a curved rack member fixedly mounted internally of the forward portion of said elongated housing structure, tips of the internally positioned toothed surface of said rack member and the external surface of said housing structure which is behind said rack member lying in curved planes which have their centers coincident with said armrest pivot pin; a parallelogram linkage mounted interiorly of said hollow housing structure, said housing structure solely comprising one of the longer links of said linkage and said round support bar and said armrest pivot pin, respectively, comprising the pivot joints between said housing and the rearward and forward shorter links of said linkage, the rearward shorter link of said linkage being non-rotatably affixed to said support bar at one of its ends and to an elongated link means at its other end, the forward shorter link of said linkage comprising at least one plate-like member on which a locking pawl is mounted for selective movement into spring biased locking engagement with one of the teeth of said rack member, said locking pawl being movable by a manually actuated lever out of engagement with said rack member when it is desired to adjust the position of said housing structure and the height of said armrest.

4,496,191

SELECTIVE MINING FROM HORIZONTAL HOLES

Dai-Shik Choi, and David L. McCain, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 1, 1982, Ser. No. 413,653
Int. Cl.³ E21C 37/12
U.S. Cl. 299—17 **4 Claims**

1. A method of selectively mining only the high grade portion of an ore body comprising:

(a) locating said high grade portions in said ore body;

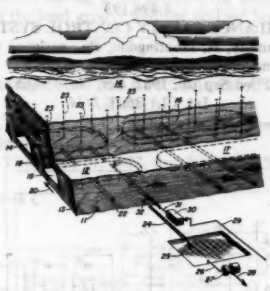
(b) forming an access to said ore body of a depth and width to permit horizontally drilling into said ore body;

(c) boring a horizontal hole into said ore body so that said hole penetrates as many of said high grade portions as possible;

(d) providing casing in said horizontal hole except at the high grade portion farthest from the said trench;

(e) inserting a jet mining tool into the horizontally bored hole to the high grade portion farthest from the said trench;

(f) jet mining said high grade portion in a manner to slurry



said mined material from said high grade portion of said ore out of said horizontally bored hole and casing;

(g) collecting said slurry material for further processing;

(h) moving said jet mining tool from said farthest location to the next adjacent high grade portion along said horizontally bored hole and removing the casing from that portion; and

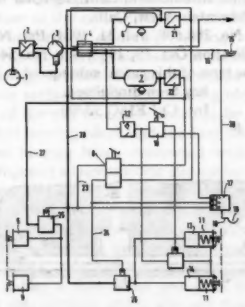
(i) repeating steps (f), (g) and (h) until all the located high grade portions are mined.

4,496,192

PRESSURE MEDIUM BRAKE SYSTEM

Ingolf Grauel, Vaihingen/Enz; Gerald Höfer, Flacht; Günter Kulke, Esslingen, and Werner Stumpe, Kornwestheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 395,878
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133963
Int. Cl.³ B60T 11/24
U.S. Cl. 303—13 **7 Claims**



1. In a pressure medium brake system for motor vehicles having different pressure circuits, the system including: a high-pressure fluid producing system; a normal-pressure fluid brake system; and pressure limiting means connected to the high-pressure producing system and the normal-pressure brake system to regulate the high pressure downward to the normal pressure, the improvement comprising,

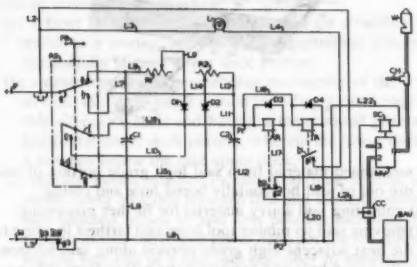
valve means having an outlet connected to different pressure circuits and an inlet connected to the high-pressure producing system and a dual circuit brake valve for controlling fluid under normal pressure to control said valve means to control fluid under high pressure for a rapid pressure increase at the pressure circuits to a maximum level of the normal pressure.

4,496,193

VIGILANCE SAFETY CONTROL SYSTEM

Steven C. Rumsey, N. Huntingdon, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Sep. 20, 1982, Ser. No. 419,652
Int. Cl.³ B60T 7/14
U.S. Cl. 303—19 **9 Claims**



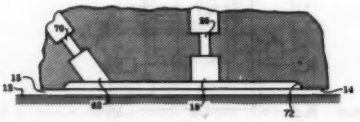
1. A vigilance safety control system for periodically checking the alertness of a train operator comprising, a pair of charging circuits connectable to a source of voltage, a pair of discharging circuits connectable to a first relay, a reversing switch for selectively and periodically connecting one of said pair of charging circuits to the voltage source and one of said pair of discharging circuits to said first relay for causing a magnet valve to maintain the brakes of the train in their released position, and said reversing switch connects one of said pair of discharging circuits to a second relay which controls a warning device to alert the train operator to shift said reversing switch.

4,496,194

GAS BEARING

Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Division of Ser. No. 288,680, Jul. 31, 1981, Pat. No. 4,413,864.
This application Oct. 19, 1983, Ser. No. 543,432
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.³ F16C 32/06
U.S. Cl. 308—5 R **18 Claims**



1. A gas bearing comprising:

a gas inlet;

a body having a pocket formed in a surface thereof and having first and second openings in the pocket;

a first passage through a portion of the body connected to the gas inlet and the first opening;

first restrictive means for restricting the flow of gas through the first passage;

an enclosed chamber disposed in the body and associated exclusively with the aforementioned pocket;

a second passage through a portion of the body, the second passage being connected to the chamber and the second opening; and

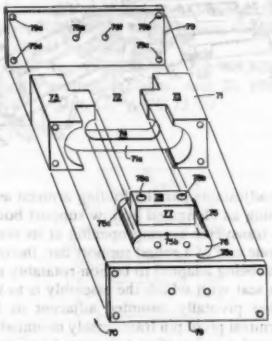
second restrictive means for restricting the flow of gas through the second passage.

4,496,195

RECIRCULATING BEARING ASSEMBLY

Ki C. Kwon, Charlotte, and Thomas A. Luther, Matthews, both of N.C., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 24, 1982, Ser. No. 444,292
Int. Cl.³ F16C 29/06
U.S. Cl. 308—6 C **4 Claims**



1. A bearing assembly for use in supporting a pair of members for relative movement, said bearing assembly comprising first and second circuitous arrays of rotatable bearing elements disposed adjacent opposite sides of said bearing assembly, each of said arrays of bearing elements including a first linear group of bearing elements having outer side surfaces which roll on a surface of a first one of the members, a second linear group of bearing elements which extends parallel to the first linear group of bearing elements, and arcuate end groups of bearing elements extending between said first and second groups of bearing elements, one-piece bearing block means for engaging said arrays of bearing elements and transmitting a load applied against said bearing block means by the first linear group of bearing elements in each of said arrays of bearing elements to a second one of the members, said one-piece bearing block means including a load section having a continuous flat load surface which faces in a first direction toward the first linear group of bearing elements in each of said arrays of bearing elements, said load surface including a first surface area which is engaged by the first linear group of bearing elements in the first array of bearing elements, a second surface area which is engaged by the first linear group of bearing elements in the second array of bearing elements and a connector surface area which extends between the first and second surface areas, said load section of said bearing block means further including a third surface area which is disposed on a side of said load section opposite from and extends parallel to said first surface area and which is engaged by the second linear group of bearing elements in the first array of bearing elements, a fourth surface area which is disposed on a side of said load section opposite from and extends parallel to said second surface area and which is engaged by the second linear group of bearing elements in the second array of bearing elements, first and second arcuate end surface areas which extend between said first and third surface areas and are disposed at opposite ends of said load section in engagement with the arcuate end groups

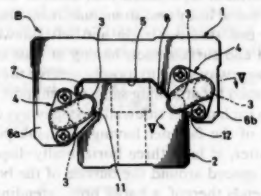
of bearing elements in said first array of bearing elements, and third and fourth arcuate end surface areas which extend between said second and fourth surface areas and are disposed at opposite ends of said load section in engagement with the arcuate end groups of bearing elements in said second array of bearing elements, said one-piece bearing block means further including mounting means which projects from a side of said load section opposite from said load surface and is adapted to be connected with the second one of the members, said mounting means being integrally formed as one piece with said load section of said bearing block means, said mounting means including a mounting section connected with said load section of said bearing block means at a location between said third and fourth surface areas and projecting from said load section in a second direction opposite from the first direction, said bearing assembly further including housing means for partially enclosing said first and second arrays of bearing elements and said bearing block means, said housing means including a frame having a central portion which engages said load section of said bearing block means and a pair of end portions which engage the arcuate end groups of bearing elements in said first and second arrays of bearing elements, said central portion of said frame having an open ended recess through which said load section of said one-piece bearing block means extends, said recess in said central portion of said frame having a flat side surface which faces in the second direction and is disposed in abutting engagement with said connector surface area on said load section, said recess having an opening through which said mounting section of said one-piece bearing block means extends in the second direction away from said flat side surface of said recess.

4,496,196

LINEAR SLIDE BEARING AND LINEAR SLIDE TABLE USING THIS BEARING

Hiroshi Teramachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo 158, Japan

Filed Mar. 29, 1983, Ser. No. 479,928
Claims priority, application Japan, Mar. 29, 1982, 57-49170
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **8 Claims**



1. A linear slide bearing comprising:

a slide block having a recess formed on the underside, the slide block being formed in cross section into the shape of letter C, the slide block having an upwardly facing inclined surface on the upper inner side of one arm thereof and a downwardly facing inclined surface on the inner side of the other arm, the upwardly and downwardly facing inclined surfaces, each having a load ball groove semicircular in cross section, cut in the downwardly and upwardly facing inclined surfaces so that these grooves extend longitudinally along these surfaces, each arm of the slide block having a no-load ball hole cut longitudinally therethrough;

a guide rail having its upper portion formed into the shape similar in cross section to that of the recess of the slide block, the guide rail having a downwardly facing inclined surface formed by a V-shaped recess on one side and an upwardly facing inclined surface on the shoulder on the other side, the downwardly and upwardly facing inclined surfaces having longitudinally extending ball-rotating grooves semicircular in cross section; a plurality of balls acting as a series of load-carrying balls when running in the load region formed by the load ball grooves on the slide block and the mating ball-rotating grooves on the guide rail, the plurality of balls also acting as a series of no-load balls when running in the no-load ball holes in the slide block; and

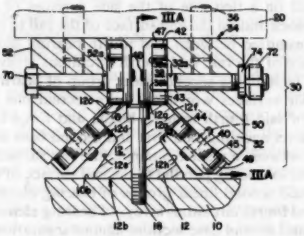
guide covers mounted to both ends of the slide block, the guide covers having guide grooves for guiding the balls between the load groove and the no-load hole.

4,496,197

LINEAR MOTION BEARING TRUCK AND RAIL ASSEMBLY

Ki C. Kwon, Charlotte, N.C., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 11, 1983, Ser. No. 484,019
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **10 Claims**



1. A bearing assembly for use in supporting a member for movement along a rail having a longitudinally extending end surface, a first longitudinally extending side surface diposed adjacent to a first edge of the end surface and skewed at an acute angle to the end surface and a second longitudinally extending side surface disposed adjacent to a second edge of the end surface and skewed at an acute angle to the end surface, said bearing assembly comprising a first base section adapted to be disposed adjacent to the first side surface and first edge of the end surface of the rail, first connector means for use in connecting said first base section with the member, a first bearing block connected with said first base section and disposed adjacent to the first side surface of the rail, said first bearing block having a side surface extending parallel to the first side surface of the rail, a first circuitous array of bearing elements circumscribing said first bearing block, said first circuitous array of bearing elements including a first linear group of bearing elements having outer side surfaces which roll on the side surface of said first bearing block and the first side surface of the rail to enable force to be transmitted between said first bearing block and the first side surface of the rail, a second bearing block connected with said first base section and disposed adjacent to the end surface of the rail, said second bearing block having opposite side surfaces extending parallel to the end surface of the rail and extending at an acute angle to the side surface of said first bearing block, a second circuitous array of bearing elements circumscribing said second bearing block, said second circuitous array of bearing elements including a first linear group of bearing elements having outer side surfaces which roll on a first one of the side surfaces of said second bearing block and on the end surface of the rail to enable force to be transmitted between said second bearing block and the end surface of the rail, said second circuitous array of bearing elements including a second linear group of bearing elements having side surfaces which roll on a second one of the side surfaces of said second bearing block, a second base section formed separately from said first base section and adapted to be disposed adjacent to the second side

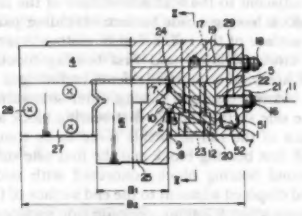
surface and second edge of the end surface of the rail, second connector means for use in connecting said second base section with the member, a third bearing block connected with said second base section and disposed adjacent to the second side surface of the rail, said third bearing block having a side surface extending parallel to the second side surface of the rail, a third circuitous array of bearing elements circumscribing said third bearing block, said third circuitous array of bearing elements including a first linear group of bearing elements having outer side surfaces which roll on the side surface of said third bearing block and the second side surface of the rail to enable force to be transmitted between said third bearing block and the second side surface of the rail, a fourth bearing block connected with said second base section and disposed adjacent to the end surface of the rail, said fourth bearing block having opposite side surfaces extending parallel to the end surface of the rail and extending at an acute angle to the side surface of said third bearing block, a fourth circuitous array of bearing elements spaced from said second circuitous array of bearing elements and circumscribing said fourth bearing block, said fourth circuitous array of bearing elements including a first linear group of bearing elements having outer side surfaces which roll on a first one of the side surfaces of said fourth bearing block and on the end surface of the rail to enable force to be transmitted between said fourth bearing block and the end surface of the rail, said fourth circuitous array of bearing elements including a second linear group of bearing elements having side surfaces which roll on a second one of the side surfaces of said fourth bearing block, and force transmitting means interconnecting said first and second base sections and disposed between a plane containing the end surface of the rail and a plane extending parallel to the end surface of the rail and through said second linear groups of bearing elements in said second and fourth circuitous arrays of bearing elements to hold said first and second base sections against separation under the influence of force components transmitted between said first and third bearing blocks and the first and second side surfaces of the rail.

4,496,198

ROLLER BEARING FOR ENDLESS LINEAR MOTION

Toshiaki Geka, Funabashi, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,373
Claims priority, application Japan, Dec. 2, 1982, 57-211689
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **7 Claims**



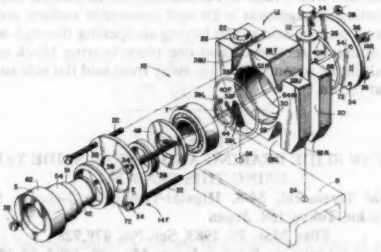
1. A roller bearing for endless linear motion wherein a casing mounted on a track rail of linear shape can perform endless linear motion through a plurality of rollers which circulate endlessly, characterized in that a circulating path of the rollers comprises, two linear ways including a load track made of right angle V grooves formed on a side surface of said track rail and an inner side surface of casing opposing said side surface of said track rail and a return hole which is parallel to said load track and which does not have its center on the bisecting plane of the V groove of said load track, and a direction changing path which is of a circular arc joining both ends of said two linear ways and allowing smooth direction change motion of the rollers, said return hole having a section of approximately square shape and being symmetric to said load track with respect to the perpendicular bisector of the line segment joining the centers of the rollers rolling in said return hole and load track, said direction changing path being a cylindrical surface of revolution which is approximately square shape in section and which is formed by revolving 180° between said load track and return hole with said perpendicular bisector being the axis of revolution.

4,496,199

PILLOW BLOCK ASSEMBLY AND SEALING SYSTEM THEREFOR

Mathieu J. Vertenstein, Denver, and Albert A. Amerigian, Aurora, both of Colo., assignors to Silver Engineering Works, Inc., Aurora, Colo.

Filed Oct. 12, 1983, Ser. No. 541,045
Int. Cl.³ F16C *19/28*
U.S. Cl. 384—474 **12 Claims**



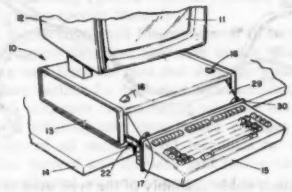
1. The pillow block for journalling a cylindrical element for rotational movement wherein said element has front and rear cylindrical surfaces separated by an annular shoulder, which comprises: a metal body cast to include front and rear substantially planar end surfaces, right and left sidewalls extending between said end surface each having at least one vertically-disposed passageway sized to loosely receive the shank portion of a fastener used for attaching same to a support therebeneath, surfaces atop each of said sidewall passageways defining a seat for the head of the fastener having its shank portion located within the latter, at least three horizontally-disposed oversize passageways spaced around the outside of the body extending between the ends thereof, a bored hole extending from end to end at least a portion of which is sized to receive a bearing and retain same in coaxial relation to said bore, and annular grooves surrounding said bored hole in both the front and rear faces thereof for receiving annular endplate seals; continuous annular static endplate seals seated within grooves in the front and rear faces of the body; front and rear endplates sized to cover both the bored hole and the horizontally-disposed passageways in the body, said endplates having apertures therein horizontally alignable with one another and with one of the horizontally-disposed passageways at opposite ends thereof, and at least one of said endplates having an oversize opening therein sized to loosely receive the cylindrical element for relative rotation; fastener means passing through the horizontally-disposed passageways in the body and aligned apertures in the endplates holding the aforesaid elements in fluid-tight assembled relation against the annular static endplate seals; and, first annular dynamic seal means carried by the cylindrical element for rotation therewith in continuous annular wiping contact with a surface bordering an oversize opening in one or both of the endplates.

4,496,200

DESK TOP KEYBOARD DISPLAY TERMINAL WITH AN ARTICULATED KEYBOARD

Arthur A. Hagstrom, Hoffman Estates, and Carl D. Swanson, Arlington Heights, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Sep. 30, 1982, Ser. No. 430,580
Int. Cl.³ A47B *21/00*
U.S. Cl. 312—208 **3 Claims**



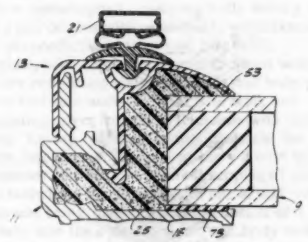
1. A desk top keyboard display terminal comprising:
a pedestal forming an enclosure and having at least top, bottom and front surfaces;
a housing for containing a CRT display, the housing mounted on top of the pedestal;
a keyboard mounted on the front surface of the pedestal; and
means for latching the keyboard to the pedestal, the means includes two substantially parallel members, each member having one end pivotably connected to the keyboard and the other end to the pedestal, each end connected to the keyboard having a slot;
a pair of movable spring loaded latches, each having a portion located above the top of the pedestal and each having a portion terminating in a tab projecting into the pedestal, wherein the tabs are arranged to engage the slots when the keyboard is moved up against the front of the pedestal, preventing further movement of the two pivotably connected members, thereby latching the keyboard to the front of the pedestal.

4,496,201

CLOSURE SUCH AS A GLASS DOOR FOR A REFRIGERATION OR FREEZER

David F. Allgeyer, Conway, Ark., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Jul. 23, 1982, Ser. No. 401,117
Int. Cl.³ E06B *3/64*
U.S. Cl. 312—296 **1 Claim**



1. A door for a refrigerator or freezer exposed to relatively warm ambient air, which may be humid, at one face constituting its front and to relatively cold ambient air at its other face constituting its rear, comprising:
an open rectangular frame having a top, bottom and sides and a glass panel in the frame, the top, bottom and both sides of the frame each comprising a front member of metal and a rear member of plastic, the front member having a part extending in front of the glass panel and the rear member having a part extending in back of the glass panel, and means for securing said members together with the glass panel between said parts;
the plastic rear members being of low thermal conductivity relative to the metal front members for reduced heat transfer from the metal front members through the plastic rear members to maintain the metal front members warmer and avoid condensation of moisture on the exposed surfaces thereof;
each front member being a length of an aluminum extrusion of such transverse cross section as to have a front flange comprising the part extending in front of the glass panel, a web extending rearward from the outer margin of the front flange a distance less than the thickness of the glass panel, a rear flange extending inward from the web at the rear of the web narrower than the front flange and having its inner margin spaced outward from the edge of the glass panel, said rear flange having a lip at its inner margin curved toward the front flange, and a rib extending rearward from the rear flange, the rib being spaced inward from the web;
said web and rear flange in conjunction with said front flange defining a formation for receving hinge pins at the top and bottom of one side of the door;
each rear member being a length of plastic extrusion of such transverse cross section as to have a second flange providing the part extending in back of the glass panel, a rim extending forward from the outer margin of said rear member flange in interengagement with the rib of the front member, and a hook member extending forward from said rear member flange in interengagement with said rear flange of a front member, said hook member comprising a resilient flexible web extending forward from said rear flange member having a hook formation at its forward edge engageable with said curved lip, said rear member flange comprising an outer portion and an inner lip portion joined by a bridge portion with a slot between the inside edge of the outer portion and the outside edge of the inner lip portion, the hook member extending forward from the bridge portion, and a gasket being provided all around the rear of the frame having a portion extending through the slot securing it in place, the gasket being engageable with the cabinet of the refrigerator or freezer;
said door having a space within the frame all around the glass panel bounded by the frame, the front flange, web and rear flange of each front member, and the hook member, the bridge portion and the inner lip portion of each rear member, said space being filled with a foamed-in-place plastic foam thermal insulation material.

4,496,202

DEVICE FOR HIGH VOLTAGE TRANSFER BETWEEN TWO PARTS WHICH ARE ROTATABLE RELATIVE TO EACH OTHER

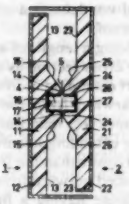
Friedrich K. Beckmann, Schenefeld; Thomas Helzel, Norderstedt, and Horst Peemöller, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,888
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221791
Int. Cl.³ H01R *39/02*
U.S. Cl. 339—5 R **6 Claims**

1. A device for transferring high voltage between two parts which are rotatable with respect to each other, said device comprising:
a first insulator body arranged around an axis of rotation;
a first electrode arrangement partially embedded in the first insulator body so as to be concentric with the axis of rotation;
a second insulator body arranged around the axis of rotation to be rotatable with respect to the first insulator body; and
a second electrode arrangement partially embedded in the

second insulator body so as to be concentric with the axis of rotation;

characterized in that the second electrode arrangement comprises a screen having a U-shaped cross-section in a plane which includes the axis of rotation, said U-shaped



cross-section opening toward the first electrode arrangement, the second electrode arrangement extending to within such a small distance of the first electrode arrangement that the two electrode arrangements bound an annular cavity which is substantially free of electric fields.

4,496,203

DRILL PIPE SECTIONS

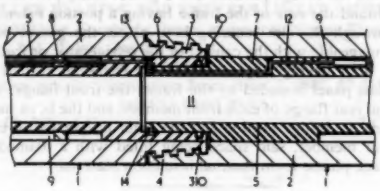
Alan Meadows, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed May 20, 1982, Ser. No. 380,385

Claims priority, application United Kingdom, May 22, 1981, 8115799

Int. Cl.³ H01R *15/30*

U.S. Cl. 339—16 C **12 Claims**



1. A drill pipe section for connection to adjacent drill pipe sections which, in use, are connected end to end to form a drill pipe string extending along a borehole, comprising a generally cylindrical housing member of electrically conductive material, a generally cylindrical lining member of relatively high resistance to electrical conduction and fixedly mounted inside and co-axial with the housing member, an electrically conductive element extending in a general direction along the two generally cylindrical members and effectively sandwiched between portions of the two generally cylindrical members, the electrically conductive element being electrically isolated from the housing member, and two annular electrically conductive coupling components associated with the ends of the electrically conductive element, respectively, one of the electrically conductive coupling components defining a radially inwardly directed electrically conductive coupling margin and the other of the two electrically conductive coupling components defining a radially outwardly directed electrically conductive coupling margin, the electrically conductive coupling components being formed by recessing the annular component into the lining member.

4,496,204

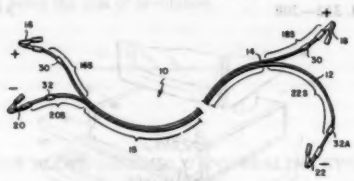
BOOSTER CABLE ASSEMBLY

William J. Conley, 36 Hervey St., Brockton, Mass. 02401

Continuation-in-part of Ser. No. 21,957, Mar. 19, 1979, abandoned. This application Mar. 30, 1983, Ser. No. 480,319

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—29 B **5 Claims**



1. In a booster-cable assembly of the type used to start automotive batteries, and formed of two conduits, each with a clamp means on each end thereof, the improvement wherein said conduits are joined in a common elongated segment over a major portion of their lengths, wherein each conduit comprises terminal segments, at each end thereof, for independent movement at each end of said common segment, and wherein the terminal segments at first end thereof differ substantially in length one from the other; wherein the terminal segments suitable for independent movement at the other end of said assembly are about equal in length with each other and with said shorter terminal segment at said first end thereof, wherein a longer terminal segment at said first end thereof is at least two times longer than said shorter terminal segment, and wherein said longer terminal cable comprises a reinforcing tube thereover, said tube comprising telescoped members, slidable, and snugly fitting one into the other and forming means to straighten said longer terminal segment.

4,496,205

LOW OR ZERO INSERTION FORCE CONNECTOR FOR MULTI-PIN ARRAYS

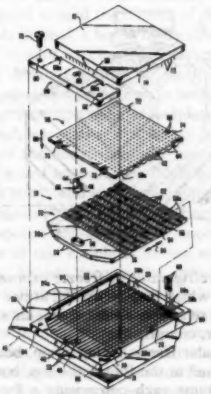
Gordon D. Christensen, San Jose, and Charles J. Donaher, Los Altos Hills, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Jul. 23, 1982, Ser. No. 401,369

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.³ H01R *13/629*

U.S. Cl. 339—74 R **16 Claims**



1. An electrical connector for interconnecting a plurality of

terminal pins in predetermined array to companion apparatus, comprising:

(a) a housing;

(b) a plurality of contacts supported by said housing in said array and extending in a common direction, each such contact having a first terminal for connection to said companion apparatus and a second terminal adapted for receiving one such terminal pin and having facing elements self-biased into preselected attitude, each facing element defining a partial boundary surface for said terminal pin upon receipt thereof;

(c) cam means supported for movement in said housing in said common direction, said cam means adapted for receiving said terminal pins and defining a further partial boundary surface for each said terminal pin upon receipt thereof, said cam means being movable between a first position wherein said cam means engages said facing elements of all such second terminals to oppose such self-bias thereof and displace said facing elements from said preselected attitude whereby said pins may be readily received in said second terminals, and a second position wherein said cam means does not oppose said second terminal self-bias whereby said facing elements may exert full force of said self-bias upon pins therebetween; and

(d) cam actuator means movable in a direction transverse to said common direction for moving said cam means between said first position and said second position.

4,496,206

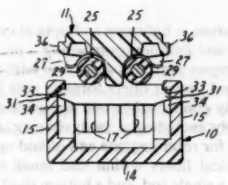
SIDE ENTRY ELECTRICAL WIRE CONNECTOR

Terrance L. Markwardt, Maplewood, and Gerald W. Telken, North Branch, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 24, 1982, Ser. No. 381,341

Int. Cl.³ H01R *11/20*

U.S. Cl. 339—98 **3 Claims**



1. An electrical wire connector comprising:

a hollow, open-topped, insulating body having a base wall and a pair of generally parallel side walls extending generally perpendicularly from said base wall,

a flat plate, wire connector element formed with a plurality of wire connecting slots retained in said body perpendicular to said side walls and said base wall, and

an insulating cover formed to telescope with said body, said cover having wire receiving channels for supporting wires, one in each channel, to carry a wire into each said connector element slot upon telescoping of said cover and said body fully together, at least one of said wire receiving channels being open-sided for insertion of a wire transversely into the channel when said body and said cover are in their open position, and at least one deformable resilient finger at the outer edge of each open-sided channel which the smallest wire size to be connected will snap past and which the largest wire size to be connected will readily press down upon insertion to retain the full range of wire sizes in the channel until the body and cover are telescoped together,

said body and cover being formed with complementary latch members to retain said body and cover in said open position to permit one wire for each wire connecting slot in said wire connector element to be inserted into said wire receiving channels and to retain said body and cover in a crimped position with said cover and body fully telescoped together.

4,496,207

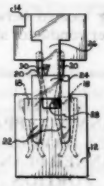
ELECTRICAL CONNECTOR WITH DUAL POSITION LATCHES

Joseph M. Ensminger, Long Lake, Minn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 962,077, Nov. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,156, Aug. 12, 1977, abandoned. This application May 27, 1980, Ser. No. 153,207

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—99 R **1 Claim**



1. In a connector for terminating a multiconductor flat cable having a base member with insulation-displacing contacts projecting therefrom, a unitary cover member having a guide slot therein containing spaced parallel scalloped surfaces for receiving a cable and apertures for receiving said contacts and a latching arrangement to hold the base and cover together in the assembled position, the improvement comprising,

having a dual latch arrangement wherein said cover member has a single parallel beam projecting from each side therefrom with a pair of integral spaced stops one above the other on each of said beams and said base member has an integral latching yoke with a pair of arms that extend upwardly from said base at each end, each said yoke having a cross-piece separating said arms located between stops in a pre-assembly position and beyond the stops in a latched position of the cover member with respect to the base member, each said beam being slidable between the arms of the yoke and between the cross-piece and the side wall of said base member, the ends of said contacts being enclosed in said apertures in the pre-assembly position and projecting through the guide slots in the latched position.

4,496,208

PLUG INNER CONDUCTOR FOR HF COAXIAL CABLES

Georg Spinner, Westerham, and Franz X. Pitschi, Rottach-Egern, both of Fed. Rep. of Germany, assignors to Spinner GmbH Elektrotechnische Fabrik, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,920

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 8112282[U]

Int. Cl.³ H01R *17/18*

U.S. Cl. 339—177 R **9 Claims**

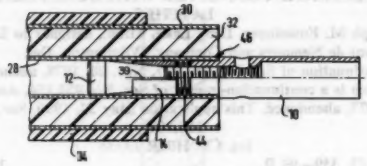
1. A plug inner conductor for connection to a tubular inner conductor of a coaxial cable, said plug inner conductor comprising:

a spreading sleeve having a slot formed therein which permits the effective diameter of said sleeve to be increased;

a clamping cone inserted through said spreading sleeve, the shape of said spreading sleeve and said clamping cone being such that said clamping cone places a radially outward force on said spreading sleeve, and thereby tends to increase the effective diameter of said spreading sleeve, as said clamping cone is moved axially through said spreading sleeve;

an inner conductor sleeve;

means for coupling said inner conductor sleeve to said clamping cone in such a manner that said clamping cone is moved axially with respect to said inner conductor sleeve as said inner conductor sleeve is rotated with respect to said clamping cone; and



a compression spring located between confronting radial surfaces of said inner conductor sleeve and said spreading cone.

4,496,209

OPTICAL BEAM SCANNING APPARATUS INCLUDING A CYLINDRICAL LENS HAVING ITS OPPOSITE ENDS CLOSER TO THE SCANNED PLANE THAN ITS MEDIAL PORTION

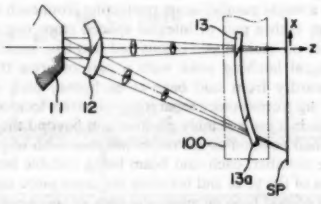
Toyotsugu Itoh, Hachioji, and Toshio Muramatsu, Musashino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,811

Claims priority, application Japan, Mar. 21, 1982, 57-45058; Mar. 21, 1982, 57-45059

Int. Cl.³ G02B *27/17, 7/02*

U.S. Cl. 350—6.8 **16 Claims**



1. In an optical beam scanning apparatus wherein a light beam from a light source is reflected by a rotary polygonal mirror and then radiated to a scanned plane through a condensing lens for scanning of the beam, the improvement in that a beam shaping means for forming a flat light beam which has a large width in the scanning direction and which is substantially parallel with the direction of the optical axis is disposed between said light source and said rotary polygonal mirror, and a cylindrical lens bent to have both ends in the longitudinal direction thereof approaching to said scanned plane is disposed between said condensing lens and said scanned plane in the vicinity of the latter.

4,496,210

LOW TEMPERATURE-FLEXIBLE RADIATION-CURABLE UNSATURATED POLYSILOXANE COATED FIBER OPTIC

Robert E. Ansel, Hoffman Estates; Orvid R. Cutler, Rolling Meadows, and Elias P. Moschovis, Morton Grove, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 19, 1982, Ser. No. 398,161

Int. Cl.³ B05D *5/06*; G02B *5/172*

U.S. Cl. 350—96.3 **18 Claims**

1. An optical glass fiber prime coated with an ultraviolet-cured coating composition having a modulus of elasticity at room temperature and at −60° C. below 3000 psi. said coating composition being a liquid, polyethylenically unsaturated, radiation-curable coating composition consisting essentially of an organic polysiloxane having from 2 to 6 reactive side chains each of which carry a functional group providing one reactive site which has been reacted to provide a single radiation-curable monoethylenically unsaturated side chain, there being about one such side chain for every 500 to 5,000 units of molecular weight.

4,496,211

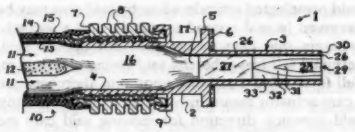
LIGHTPIPE NETWORK WITH OPTICAL DEVICES FOR DISTRIBUTING ELECTROMAGNETIC RADIATION

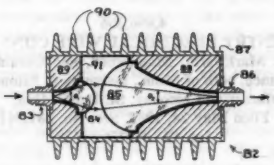
Maurice Daniel, 550 Jaycox Rd., Avon Lake, Ohio 44012

Filed Dec. 5, 1980, Ser. No. 213,462

Int. Cl.³ G02B *5/17*

U.S. Cl. 350—96.20 **21 Claims**





1. In combination, a lightpipe and optical coupler assembly for terminating said lightpipe comprising a plurality of optical fibers each having an optical core section with an optical index of refraction, said optical fibers forming said lightpipe, and a coupler assembly connected to one end of said lightpipe, said coupler assembly including a body having a hollow inner sleeve structure for receiving one end of said optical fibers, the end of said optical fibers within said inner sleeve structure being fused into a single rod, and a hollow shaft section extending coaxially from said inner sleeve structure, said hollow shaft section including optical mixing means mounted therein for receiving light from the fused end of said optical fibers, said optical mixing means having an index of refraction which is substantially equal to the index of refraction of the optical core section of said optical fibers.

4,496,212

DEAD END FITTING FOR USE IN OVERHEAD ELECTRIC AND OPTICAL TRANSMISSION SYSTEMS

Peter Harvey, London, England, assignor to BICC Public Limited Company, London, England

Filed Feb. 15, 1983, Ser. No. 466,742

Claims priority, application United Kingdom, Feb. 18, 1982, 8204766

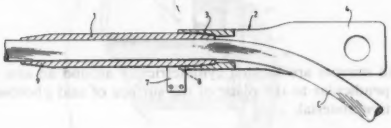
Int. Cl.³ G02B *7/26*; H02G *7/00*

U.S. Cl. 350—96.20 **7 Claims**

1. A dead end fitting for connection to an end of an overhead electric conductor having, within a substantially circumferentially rigid central core, an elongate compartment in which is loosely housed at least one optical fibre, which dead end fitting comprises a sleeve of malleable metal or metal alloy, open at each of its ends, for compression jointing to an overhead electric conductor; a separately formed termination of metal or metal alloy of high mechanical strength which, over a part of

its length at one of its ends, is of generally tubular form and is in screw threaded engagement with an end of the sleeve and which, at the other of its ends, is in the form of a clevis; and, for effecting electrical connection to an electric jumper cable, a separately formed lug which is permanently secured to the sleeve, a part of the lug engaging in a notch in the adjacent end of the termination to positively lock the screw threaded engagement between the sleeve and termination.

2. An overhead electric and optical transmission system of the kind in which at least one overhead electric conductor has, loosely housed in an elongate compartment in a central core, at least one optical fibre, in which system at least one said over-



head electric conductor is mechanically secured to a tower through at least one electric insulator by means of a dead end fitting comprising a sleeve of malleable metal or metal alloy, open at each of its ends, and compression jointed at one end to the overhead electric conductor to such an extent that the central core of the overhead conductor is not so distorted that there is risk of damage to the or any optical fibre loosely housed in the elongate compartment in the central core; means at the other end of the sleeve securing the fitting to said electric insulator and of such a form that access to said other open end of the sleeve is not impeded; and means on the sleeve electrically connecting the sleeve to an electric cable.

4,496,213

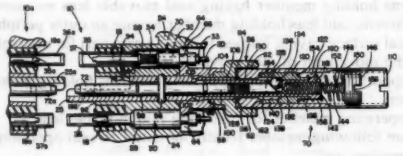
AUDIBLE INDICATOR FOR A CONNECTOR

Leslie M. Borsuk, Los Alamitos, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,738

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.22 **16 Claims**



1. A connector member adapted to mate with a second connector member having an actuating surface thereon comprising:

a connector body containing at least one contact;

said connector body having a front face;

a movable actuating element slidable in an axially extending passage in said body, said actuating element being exposed at said front face of said body and adapted to be moved by the actuating surface of said second connector member when said connector members are mated; and

means in said connector body for providing an audible indication of mating of said connector members, said means being responsive to movement of said actuating element by said actuating surface of said second connector member.

4,496,214

OPTICAL CABLE

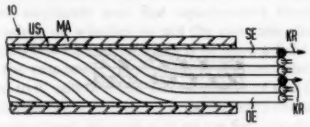
Ulrich Oestreich, and Werner Schubert, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 17, 1982, Ser. No. 349,452

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108381

Int. Cl.³ H02B 5/16

U.S. Cl. 350—96.23 **10 Claims**



1. In an optical cable having a plurality of optical transmission elements and a plurality of auxiliary elements for supporting tension loads, said transmission elements each having at least one optical fiber and being stranded with the auxiliary elements on a central core with an alternating direction of twist to form at least one layer of SZ stranded elements, said cable including a common jacket surrounding the SZ stranded elements, the improvement comprising means for holding the SZ stranded optical transmission elements and auxiliary elements inside of the jacket so that a longitudinal pull on at least one auxiliary element at a point of separation of the cable causes the SZ stranding of both the auxiliary element and the adjacent optical transmission elements to be cancelled over a limited length of the elements and provides an excess length for each of the elements.

4,496,215

FIBER OPTIC CABLE

Joseph M. Shaheen, La Habra, and Herbert W. Yancey, Downey, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 23, 1982, Ser. No. 421,761

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 **12 Claims**

1. A relatively flat fiber optic cable having at least one contour for connecting at least one optical transmitter to at least one optical sensor in an electronic assembly, said relatively flat fiber optic cable comprising:

at least one flat, straight segment, each flat, straight segment having;

a first surface layer;

a second surface layer, said first and second surface layers being stacked in parallel plane relation;

a resin layer, said first surface layer and said second surface layer being bonded together by said resin layer;

a plurality of fiber optic filaments, each said fiber optic filament being embedded in said resin layer in a predetermined pattern; each said fiber optic filament being spaced in precise predetermined parallel relation with adjacent fiber optic filaments within said flat straight segment of said fiber optic cable, said flat fiber optic cable also having;

at least one curved segment, each respective curved segment having;

an entry segment,

an exit segment, and

a contoured segment having a predetermined contour and being interposed between said entry segment and said exit segment;

each respective entry segment and each respective exit segment having;

a top surface layer,

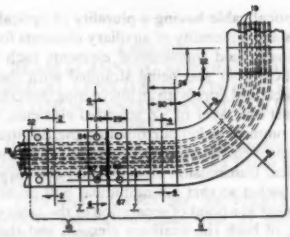
an adhesive layer interposed between said top surface

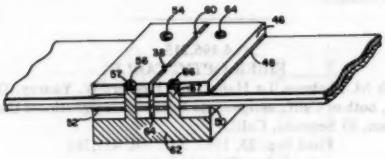
layer and said first surface layer, said top surface layer being laminated to said first surface layer;

a bottom surface layer,

a bottom adhesive layer interposed between said bottom surface layer and said second surface layer, said bottom surface layer being laminated to said second surface layer by said bottom adhesive layer;

means for terminating each respective fiber optic filament to facilitate optically coupling each respective optical transmitter to a respective optical sensor;





whereby, said first surface layer, said second surface layer, said resin layer and said fiber optic filament form a relatively flat, thin, flexible, ribbon fiber optic cable having at least one contour and a cross section relatively free of voids; said fiber optic cable's relative flatness, thinness and flexibility facilitating installation of said fiber optic cable in an electronic assembly and wherein said entry segment and said exit segment couple said contoured segment to said fiber optic cable.

4,496,216

METHOD AND APPARATUS FOR EXPOSING PHOTOSENSITIVE MATERIAL

James J. Cowan, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 30, 1982, Ser. No. 454,728

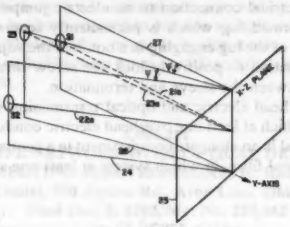
Int. Cl.³ G02B *5/18*

U.S. Cl. 350—162.17 **16 Claims**

1. An apparatus for simultaneously exposing a photosensitive material to at least three coherent beams of exposing radiation which comprises

a laser;

means for dividing the wavefront of said beam emanating from said laser into equal parts; at least three mirrors reflecting said divided beams, the number of said mirrors corresponding to the number of parts of said beam, and wherein



said mirrors are located symmetrically around an axis perpendicular to the plane of the surface of said photosensitive material.

4,496,217

ACTUATING DEVICE FOR PHOTOGRAPHIC LENS ASSEMBLY

Masao Aoyagi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

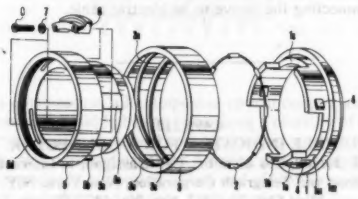
Continuation of Ser. No. 324,521, Nov. 24, 1981, abandoned.

This application Feb. 28, 1984, Ser. No. 583,293

Claims priority, application Japan, Nov. 28, 1980, 55-170716[U]

Int. Cl.³ G02B *7/04*; F16H *53/06*

U.S. Cl. 350—255 **7 Claims**



1. A device for actuating a movable lens defining an optical axis comprising:

a lens holding member having said movable lens mounted therein, said lens holding member having an outer peripheral surface having formed thereon a cam part for controlling movement of said movable lens;

a supporting member for supporting said lens holding member;

an operating member for operating said movable lens;

a cam following member fixedly mounted on said operating member; and

adjusting means to adjust fixed positions of said cam following member and said lens holding member, said adjusting means operating to adjust the fixed position of said cam following member in the direction around said optical axis.

4,496,218

HYDRAULIC AUTOMATIC LIGHT CONTROL

Charles E. Woods, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1982, Ser. No. 391,817

Int. Cl.³ G05D *25/00*

U.S. Cl. 350—267 **12 Claims**

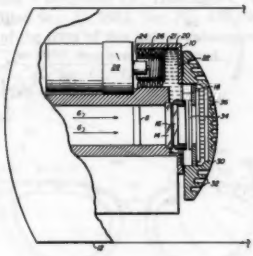
1. A hydraulic automatic light control consisting of:

a housing;

a fixed optical element mounted in said housing for permitting light to pass through said housing;

a movable optical element attached to said housing by a diaphragm and placed in proximity to but not against said fixed optical housing such that light must pass through both optical elements and the space between them to pass through said housing;

a working fluid in the space between said optical elements for creating an absorption path;



a piston sealing said working fluid in said space between optical elements for exerting a pressure on said fluid; and

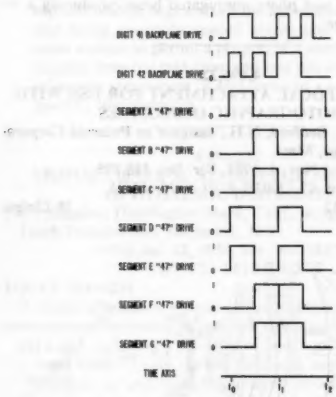
a drive motor connected to said piston for moving said piston such that the change of pressure on said fluid varies the amount of flexing by said diaphragm which in turn changes the thickness of working fluid between the optical elements.

4,496,219

BINARY DRIVE CIRCUITRY FOR MATRIX-ADDRESSED LIQUID CRYSTAL DISPLAY

Ted N. Altman, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1982, Ser. No. 432,780
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—332 **5 Claims**



1. A matrix-addressed liquid crystal display system including:

an electrically controlled liquid crystal display divided into modules, each module having a common electrode and a plurality of opposed segment electrodes between which potential gradients may be selectively established through the liquid crystal;

means for time-division-mulitplex addressing the common electrodes of said modules during sequential addressing intervals, including

means for applying a first phase of square-wave signal of a predetermined amplitude and a first square-wave repetition rate to the common electrode of the selected one of said modules during each addressing interval;

means for parallelly addressing the segment electrodes of said modules with a second phase of square-wave signal of said predetermined amplitude and said first square-wave repetition rate during each of said addressing intervals, or with first phase of square-wave signal of said predetermined amplitude and first square-wave repetition rate, depending on whether or not the common electrode of a selected one of said modules is to have a field between it and the respective ones of those segment electrodes opposed to it, said first and second phases of said first square-wave repetition rate being opposite each other; and

the improvement wherein said means for time-division-multiplex addressing the common electrodes of said modules during sequential addressing intervals also comprises:

means for applying to the common electrode of each non-selected one of said modules a square-wave signal of said predetermined amplitude, but of a second square-wave repetition rate which is an even harmonic of that applied to the common electrode of said selected module.

3. A method for deselecting a segment in a matrix-addressed liquid crystal display device which receives on the first of first and second opposing electrodes associated therewith a square-wave drive voltage of a predetermined amplitude and of a first frequency, said method comprising the step of:

applying on the second electrode a square-wave drive voltage of said predetermined amplitude and of a second frequency, which second frequency is an even harmonic of said first frequency.

5. A method for deselecting a segment in a matrix-addressed liquid crystal display device which receives on the first of first and second opposing electrodes associated therewith a first binary-valued drive voltage of a relatively high value for half of a segment selection time interval and of a relatively low value for the remaining portion of that segment selection time interval, said method comprising the steps of:

applying on the second electrode a second binary-valued drive voltage, which is of said relatively high value half the time said first binary-valued signal is said relatively high value and half the time said first binary-valued signal is said relatively low value, and which is of said relatively low value half the time said first binary-valued signal is said relatively high value and half the time said first binary signal is said relatively low value.

4,496,220

INFORMATION DISPLAY DEVICE COMPRISING A LIQUID CRYSTAL CELL

Michel Goscianski, Limeil-Brevannes, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,302
Claims priority, application France, Mar. 21, 1977, 77 08403
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—341 **11 Claims**

1. A picture display device comprising

a liquid crystal cell including a layer of nematic liquid crystal between two sets of electrodes,

said liquid crystal having molecules in proximity to said electrodes with a predetermined orientation within parallel planes that are perpendicular to the plane of said electrodes, said orientation being variable under an electric field, and

intermediate spaces between portions of said electrodes at least at one side of said liquid crystal, said liquid crystal having molecules in proximity to said intermediate spaces being at an angle differing from the angle of said molecules in proximity to said electrodes by a difference ranging from a few degrees to a few tens of degrees.

4,496,221

LIQUID CRYSTAL COMPOSITIONS WITH PLEOCHROIC ANTHRAQUINES DYES

Kenneth J. Harrison, Malvern Link; Edward P. Raynes, Malvern; Frances C. Saunders, Malvern Wells, and David J. Thompson, Whitefield, all of England, assignors to Secretary of State for Defence in Her Britanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland of Whitehall, London, England

Filed Feb. 24, 1982, Ser. No. 352,060

Claims priority, application United Kingdom, Feb. 25, 1981, 8105959; Feb. 25, 1981, 815961; Mar. 5, 1981, 8106995; Sep. 30, 1981, 8129530

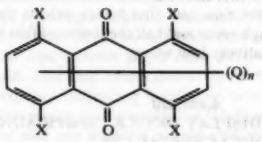
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.[3] **C09K** *3/34;* **G02F** *1/13*

U.S. Cl. 350—349 **37 Claims**

1. A composition adapted for use in a guest-host liquid crystal device, said composition comprising a solution of a liquid crystal material and a pleochroic dye in which the pleochroic dye comprises at least one anthraquinone compound free from water solubilizing and ionic substituents and has the formula:

Formula I



wherein:

n is zero or an integrer between 1 and 4 inclusive;

each Q is independently selected from NH_2, OH, C_1 to C_{20} alkyl, mono- and bi-carboxycyclic aryl, NO_2 and halo;

each X is independently selected from H, —SR,

and Q;

each R is independently selected from C_1 to C_{20} alkyl, mono- and bi-carbocyclic aryl and C_4 to C_8 cycloalkyl;

each Z is independently selected from H, C_1 to C_{20} alkyl, mono- and bi-carbocyclic aryl and C_4 to C_8 cycloalkyl;

provided that at least two of the groups X are different —SR groups.

4,496,222

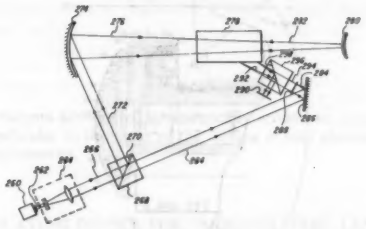
APPARATUS AND METHOD FOR PHOTOLITHOGRAPHY WITH PHASE CONJUGATE OPTICS

Rajiv R. Shah, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 332,384, Dec. 21, 1981, abandoned. This application May 1, 1984, Ser. No. 605,984

Int. Cl.[3] **G02F** *1/35*

U.S. Cl. 350—354 **4 Claims**



1. A system for producing a reduced image on a surface sensitive electromagnetic radiation comprising:

(a) an emitting device producing a beam of coherent electromagnetic radiation;

(b) a beam splitter incident to said beam separating said beam into a power beam and an imaging beam;

(c) a mask incident to said imaging beam with said original image thereon to amplitude modulate said imaging beam to form an imaged beam;

(d) a convergence device incident to said power beam to produce a converging power beam;

(e) a divergence device incident to said converging power beam to produce a diverging power beam being collinear and coextensive with said converging power beam;

(f) a nonlinear medium incident to said converging power beam, said diverging power beam, and said imaged beam to produce a phase conjugated beam; and

(g) a target object having said surface disposed thereon incident to said phase conjugated beam producing a reduced image.

4,496,223

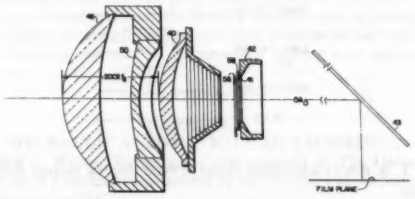
COMPACT AFOCAL ATTACHMENT FOR USE WITH PHOTOGRAPHIC OBJECTIVES

James G. Baker, Bedford, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 4, 1981, Ser. No. 318,105

Int. Cl.[3] **G02B** *9/10, 9/12, 13/18*

U.S. Cl. 350—432 **16 Claims**



1. A substantially afocal lens of Galilean form for use with a following objective lens to increase its focal length, said afocal lens consisting of no more than three lens elements the first of which is a positive meniscus element and the last of which is a

negative plastic element spaced behind said positive meniscus element, the ratio of the radius of the front surface of said first positive meniscus element to the axial separation between the first surface of said first meniscus element and the last surface of said negative plastic element being no greater than 1.3 and the angular magnification of said afocal lens being no greater than 1.5.

4,496,224

EYEGLASS FRAME WITH POCKET CLIP

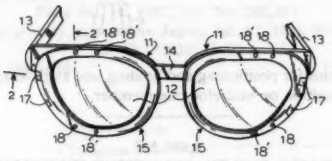
Charles B. Allen, 5 Briarfield La., Huntington, N.Y. 11743

Filed Sep. 29, 1982, Ser. No. 426,696

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ G02C *3/00*

U.S. Cl. 351—155 **10 Claims**



1. An improved frame for eyeglasses, comprising:

a pair of interconnected rims, each of which is configured to surround and support an eyeglass lens, said rims each having a top, bottom and two side segments which cooperatively define an outer surface; and

at least one clasp superimposed over at least about ¼ of the outer surface of one of said rims and resiliently secured to the side segment thereof which is distal to the other of said rims by means of at least one spring element, said clasp being configured and dimensioned to correspond to the configuration and width of the portion of the outer surface over which it is superimposed, said clasp having a central section which normally overlies said distal side segment and two arms extending from opposite ends of said central segment which normally overlie at least a portion of said top and bottom segments of the associated rim, said clasp also being generally spaced above said portion of said outer surface to permit a portion of a user's garment to be inserted between said clasp and said rim and so as to effect releasable securement of said frame to a user's garment so inserted therebetween.

4,496,225

MOTOR CONTROL SYSTEM FOR MOTORIZED OPHTHALMIC INSTRUMENT

Peter Augusto, Huntington Beach, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jul. 22, 1981, Ser. No. 285,716

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—234 **14 Claims**

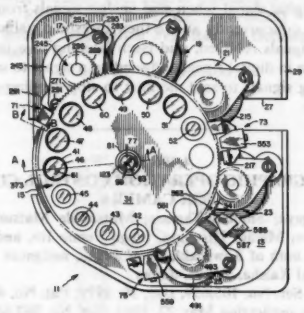
1. In an ophthalmic instrument including a base and one or more optical elements positionable along an optical axis:

(a) a disk including a plurality of openings for supporting at least some of said optical elements, said disk supported relative to said base for rotation about an axis from a position where one of said openings is aligned with said optical axis to at least one other position where another of said openings is aligned with said optical axis, one of said positions on said disk constituting a reset position when aligned with said optical axis;

(b) a stepping motor having a plurality of detent positions and a shaft for driving said disk about said rotation axis, said motor being in one of said detent positions when said disk is in said reset position;

(c) means for sending signals to said motor to rotate said disk; and

(d) means for interrupting said signals to said motor before



the magnetic detent position where said disk is in said reset position but subsequent to the immediately preceding detent position, said means including a reflective block on said disk and an encoder secured relative to said base.

4,496,226

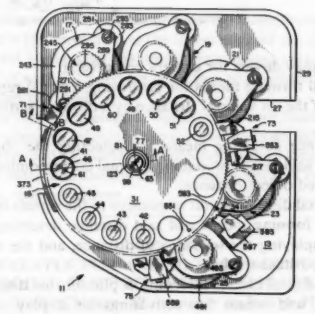
ANDED MOTOR CONTROL SYSTEM FOR MOTORIZED OPHTHALMIC INSTRUMENT

Peter Augusto, Huntington Beach, Calif., and Donn E. Stevens, Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jul. 22, 1981, Ser. No. 285,717

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—234 **6 Claims**



1. In an ophthalmic instrument comprising: a base; a rotatable optical element; a stepping motor having a plurality of detent positions and a shaft for rotating said element; means, including a rotatable support for said element, for coupling said shaft to said element, whereby said motor can rotate said element relative to said base, one of the positions of said element wherein said motor is in one of said detent positions, constituting a reset or zero position; means for sending signals to said motor to rotate said element; and means for interrupting said signals to said motor before the magnetic detent position where said element is in said reset position but subsequent to the immediately preceding detent position, said means including at least two reflective blocks secured to said coupling means, a pair of encoders, decoder logic means for transforming analog signals to digital signals coupled to said encoders, and latch means coupled to both said decoder logic means and said means for sending signals to said motor, each of said encoders including an LED and a phototransistor, each of said

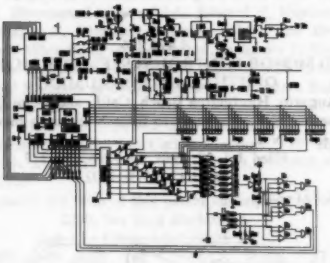
phototransistors sending analog signals to said decoder logic means, which signals change when the light emitted by said corresponding LED is reflected back to said phototransistor by said corresponding block, said decoder logic means changing said digital signal when said analog signals from said encoders are concurrently above their threshold values and the resultant signals ANDed, said latch latching as a function of said change in digital signal and sending a signal to said means for sending signals to said monitor to stop sending signals to said motor.

4,496,227

PHOTOGRAPHIC OPERATION CONTROL CIRCUIT FOR CAMERA

Isao Harigaya; Shuichi Tamura; Mutsuhide Matsuda, all of Kanagawa; Michio Hirohata, Inagi; Fumio Ito, and Tetsuya Taguchi, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 105,659, Dec. 20, 1979, Pat. No. 4,458,996.
This application May 27, 1981, Ser. No. 267,669
Claims priority, application Japan, Dec. 27, 1978, 53-165878
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—289.12 **10 Claims**



1. A display device for camera comprising:

(a) signal forming means for producing a signal representative of the set value of distance by a distance setting member;

(b) distance detecting means for detecting the object distance, said means producing a signal corresponding to the detected object distance;

(c) a digital display circuit responsive to the signals from said signal forming means and said distance detecting means for displaying the set value of distance, and the detected object distance value;

(d) said digital circuit including a plurality of display elements, and means for activating the display elements which are prescribed by the said detected object distance signal and set distance value; and

(e) said means for activating including a control circuit responsive to said distance detecting means for activating prescribed ones of said elements to form a first mark and responsive to said signal forming means for activating others of said display elements according to the set value to form a second mark different from the first mark.

4,496,228

CAMERA SUPPORT

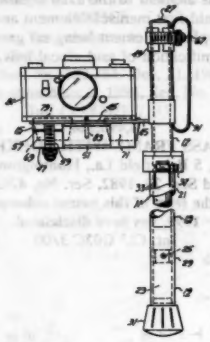
John D. Schmidt, 1634 Ovwrbrook Dr., Englewood, Fla. 33533

Filed Sep. 29, 1982, Ser. No. 426,262
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—293 **16 Claims**

1. A camera support comprising:

(a) an angle-shaped base having two legs and having fixed to each leg thereof a tubular member;

(b) an elongated member slidably disposed in one of said tubular members; and



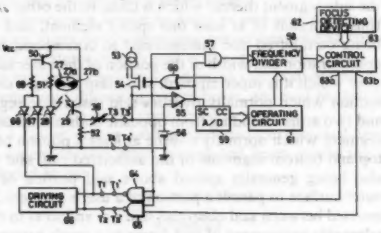
(c) means for positioning and holding said angle-shaped base in position on said elongate member.

4,496,229

APPARATUS FOR TRANSMITTING INFORMATION SIGNALS IN A CAMERA

Akira Ogasawara, Kanagawa, Japan, assignor to Nippon Kogaku K.K., Japan

Filed Jul. 26, 1983, Ser. No. 517,283
Claims priority, application Japan, Jul. 26, 1982, 57-129939
Int. Cl.³ G03B *3/10, 13/02*
U.S. Cl. 354—400 **13 Claims**



1. An auto-focusing camera having an imaging optical system with a focusing lens movable along the optical axis and means for driving said focusing lens said camera comprising:

(a) a taking lens unit with said imaging optical system including terminal means having a first electrical contact, first transmission means which, in response to the movement of said focusing lens, feeds said first electrical contact with a voltage having a substantially constant and periodically repeating peak value, and second transmission means which is energized to feed said first electrical contact with a voltage associated with the focal length of said imaging optical system; and

(b) a camera body including means for generating an information signal indicating the deviation from a predetermined focal plane of the image of the object that is formed by said imaging optical system, terminal means inclusive of a second electrical contact coupled to said first electrical contact and which is coupled to the terminal means in said taking lens unit, response means connected to said second electrical contact which, in response to said first transmission means, feeds an output signal for energizing said second transmission means between peaks of said periodic voltage, and control means preparing a signal for

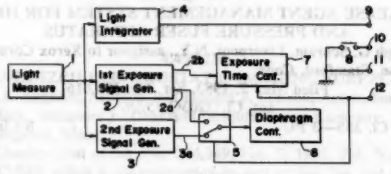
controlling said drive means from the voltage generated at said second electrical contact and said information signal.

4,496,230

EXPOSURE CONTROL DEVICE FOR CAMERAS

Masaaki Nakai, Kitakatsuragi; Masayoshi Sahara, Sennan; Hiroshi Hosomizu, Sakai, and Tokuji Ishida, Daito, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1982, Ser. No. 395,991
Claims priority, application Japan, Jul. 17, 1981, 56-112812
Int. Cl.³ G03B 15/05
U.S. Cl. 354—416 11 Claims



1. An exposure control system for a camera adapted to be coupled with an electronic flash device which supplies a control signal to the camera representing a ready condition of the device, said system comprising:

a light measuring means including a first photoelectric member for receiving light of a scene to be photographed, through a camera objective lens and the diaphragm aperture, and generating a first photoelectric signal as a function of the intensity of the received light;

a first programed signal means for generating a first exposure control signal which changes with said first photoelectric signal according to a first program for natural light photography;

a second programed signal means for generating a second exposure control signal changing in dependence on said first photoelectric signal obtained before actuation of the diaphragm without illumination of said scene by flash light and according to a second program for flash photography;

a diaphragm control means for controlling said diaphragm aperture in accordance with either said first or second exposure control signal;

a first switch means for connecting said diaphragm control means normally with said first programed signal means and with said second programed signal means in response to said control signal;

an exposure time control means for controlling camera exposure time in accordance with the photoelectric signal which is generated with said photoelectric member receiving the light through the diaphragm aperture determined by said diaphragm control means in accordance with the first exposure control signal; and

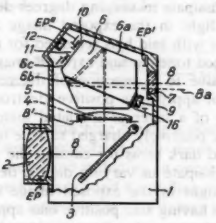
means responsive to said control signal for switching said exposure time control means to a condition for providing a predetermined exposure time suitable for flash photography.

4,496,231

MIRROR REFLEX CAMERA WITH EXPOSURE METER

Knut Heitmann, Wetzlar, and Klaus-Dieter Schaefer, Braunfels, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,253
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129069
Int. Cl.³ G03B 7/099
U.S. Cl. 354—429 8 Claims



1. A mirror reflex camera comprising:

(a) a picture taking objective having a horizontal optical axis and an exit pupil (EP) projected by said picture taking objective;

(b) exposure metering means comprising first and second photoelectric detection systems (9,12);

(c) a viewer system located along said optical axis comprising in series a focusing screen having a plane, a field lens, a pentaprism and an eyepiece, said optical axis offset in parallel from its original path by two reflections in said pentaprism and exiting said eyepiece;

(d) said pentaprism having means (6b,6c) for deviating said exit;

(e) mirror means comprising a partly transmitting concave mirror (16) provided at the lower edge of the exit surface of said pentaprism (6); said mirror means receiving light flux of said exit pupil for reflection to a surface (6c) of said pentaprism; and

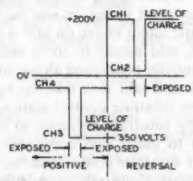
(f) said first photoelectric detection system located behind said concave mirror in the direction of said light flux and said second photoelectric detection system located behind said surface in the direction of said light flux reflected by said concave mirror.

4,496,232

APPARATUS FOR AND METHODS OF MAKING BIMODAL ELECTROPHOTOGRAPHIC COPIES

Rudolph Guzik, Chicago, Ill., assignor to Bell & Howell, Chicago, Ill.

Division of Ser. No. 110,427, Jan. 7, 1980, abandoned. This application Jun. 8, 1981, Ser. No. 271,154
Int. Cl.³ G03G 15/00; G01D 15/06
U.S. Cl. 355—3 CH 7 Claims



1. A bimodal electrophotographic imaging reader/printer for reading and printing either black on white or white on

black original documents, with the printing always being black on white copy, whereby said reader/printer may operate in either a positive or a reversal mode of operation, said reader/-printer comprising:

means for selectively applying a positive bias for a reversal mode of printout interchangeably with a removal of said bias for a positive mode of operation;

means responsive to a selection of the positive mode of operating for applying a negative electrostatic charge to one surface of a layer of a coated material, means for exposing the negatively charged surface to an image having light and dark areas for causing the negative surface charge to dissipate in varying degrees depending on the amount of light in the exposed image areas, magnetic brush means with said bias removed for applying a positively charged toner to said exposed image area;

means responsive to a selection of the reversal mode of operating for applying a positive electrostatic charge to one surface of a layer of a coated material, means for exposing the positively charged surface to an image having light and dark areas for causing the positive surface charge to dissipate in varying degree depending on the amount of light in the exposed image areas, magnetic brush means having said positive bias applied thereto for applying said positively charged toner to said exposed image area; and

means for fusing the deposited toner onto the coated material in both of said modes of operation.

4,496,233

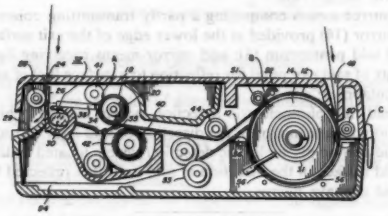
ELECTROSTATIC REPRODUCING MACHINE

Charles A. Gage, Webster; Timothy T. Blair, Shortsville, and Thomas W. Morgan, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1983, Ser. No. 489,622

Int. Cl.³ G03G *15/16*

U.S. Cl. 355—3 TR **20 Claims**



1. An electrostatographic reproducing apparatus comprising a movable resuable electrostatographic imaging web having an insulating imaging surface on an electrically grounded conductive substrate, a web supply roll and a web take up roll comprising a conductive substrate and a dielectric coating thereon, one end of said web being fastened to said web supply roll, the other end of said web being fastened to said web take up roll, said web supply roll and said web take up roll being spaced apart, means to transport an imaging surface along a path past a series of operational processing stations including means to form an electrostatic latent image on said web, means to develop said electrostatic latent image on said web with toner to form a toner image, said means to form and said means to develop being sequentially positioned along said web between said web supply roll and said web take up roll; a developed toner image and copy substrate contact station, said apparatus also including a copy substrate entrance to the apparatus, a copy substrate path to guide said copy substrate from said entrance to said copy substrate contact station, means to transport said copy substrate along said copy substrate path, the distance along the imaging surface path from said image forming station where the lead edge of an image is formed on the imaging surface to the initial line of contact of the imaging surface with the copy substrate being equal to the distance along said copy substrate path from the copy sheet entrance to the initial line of contact of the lead edge of the copy substrate with the lead edge of the image on the imaging surface, drive means to contact the leading edge of the toner image on said web with said lead edge of a copy substrate, means to wind said imaging web with said developed toner image thereon and said copy substrate around said take up roll to form a sandwich comprising said insulating layer bearing said electrostatic latent image and toner image, said sandwich comprising in sequential order a conductive substrate support for said insulating layer, said insulating layer, the toner image, copy substrate, dielectric layer, and conductive electrode; means for applying a potential to said conductive electrode after said sandwich is formed of a magnitude and potential sufficient to create an electric field to transfer toner from the insulating layer to the copy substrate, means to discharge the electrostatic latent image on said insulating layer before separation of said sandwich, and means to strip said copy substrate from said dielectric layer while said field is applied, drive means to unwind said web from said take up roll and to rewind said web on said supply roll in preparation for the next imaging cycle.

4,496,234

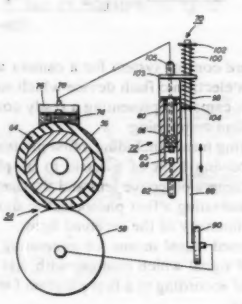
RELEASE AGENT MANAGEMENT SYSTEM FOR HEAT AND PRESSURE FUSER APPARATUS

Joseph G. Schram, Liverpool, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1983, Ser. No. 490,616

Int. Cl.³ G03G *15/20*

U.S. Cl. 355—3 FU **8 Claims**



1. Release agent management apparatus for use with a heat and pressure fuser for fixing toner images to copy substrates by passage of the substrates between two pressure engaged rolls, said apparatus comprising:

a pump including a piston;

means operatively coupling said pump to one of said two rolls whereby said pump is actuated upon the engagement and disengagement of said two rolls; and

means responsive to actuation of said coupling means for causing said pump to operate at a variable velocity.

4,496,235

FUSER APPARATUS

Ernest J. Tamary, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1983, Ser. No. 499,638

Int. Cl.³ G03G *15/20*

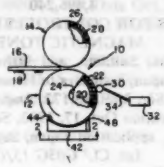
U.S. Cl. 355—3 FU **8 Claims**

7. Fuser apparatus comprising

means having a fusing surface for fusing an unfused image carried by a support brought into contact with said surface, said surface (1) being dimensioned to fuse supports of

a maximum predetermined dimension and supports of at least one lesser dimension and (2) being coated with release material; and

means for removing excess release material in the areas of



said fusing means surface between the ends of said lesser dimensioned support and the ends of said maximum dimensioned support and for redistributing such removed release material to the portion of said surface in contact with said lesser dimensioned support.

4,496,236

ANODIZED ELECTROSTATIC IMAGING SURFACE

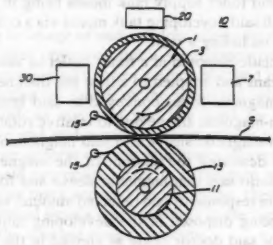
Leo A. Beaudet, Milford, and Donald J. Lennon, Acton, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 346,349, Feb. 5, 1982, Pat. No. 4,413,049, which is a continuation-in-part of Ser. No. 164,482, Jun. 30, 1980, , which is a continuation-in-part of Ser. No. 155,354, Jun. 2, 1980,. This application Sep. 6, 1983, Ser. No. 529,195

The portion of the term of this patent subsequent to Nov. 1, 2000, has been disclaimed.

Int. Cl.³ G03G *15/22*

U.S. Cl. 355—3 DR **17 Claims**



1. Electrostatic imaging apparatus, comprising:

a dielectric image member, comprising a substrate of a material selected from the group aluminum and aluminum alloys, with a dielectric surface layer having a resistivity of at least 10^{12} ohm-centimeters produced by hardcoat anodizing the substrate to form an oxide surface layer, dehydrating the oxide surface layer, impregnating the dehydrated surface layer with a material selected from the group consisting of compounds of Group II or Group III metals with fatty acids, and removing excess material from the member's surface;

means for forming a latent electrostatic image on the dielectric image member;

means for toning the latent electrostatic image; and

means for simultaneously transferring and fusing the toned image from the image member to an image receptor.

4,496,237

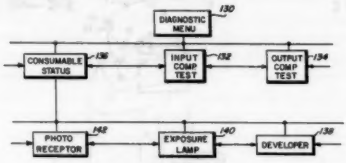
CONSUMABLE STATUS DISPLAY

Steven M. Schron, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 9, 1982, Ser. No. 406,652

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 C **3 Claims**



1. In a reproduction machine having a plurality of discrete operating components cooperable with one another to produce images on copy sheets and including an operator console having an alphanumeric display and a scrolling switch and a controller with a nonvolatile memory for storing indications of the operation of selected operating components, the operating components being grouped into categories, each category having subcomponents for monitoring, the method of monitoring the operation of a selected operating component including the steps of

entering a display mode to display a diagnostic menu,

scrolling the categories of reproduction machine components on the display in response to the activation of said scrolling switch,

selecting a category of machine components,

scrolling a set of subcomponents on the alphanumeric display within the said first selected category in response to the activation of said scrolling switch, and

selecting one of said subcomponents for monitoring.

4,496,238

IMAGE RECORDING APPARATUS

Masaharu Tsukada, Kawasaki; Junichi Kimizuka, and Haruo Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,893

Claims priority, application Japan, Apr. 15, 1982, 57-54726[U]

Int. Cl.³ G03G *15/00*

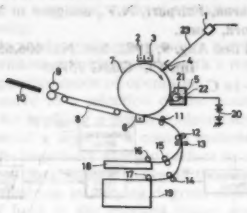
U.S. Cl. 355—14 D **2 Claims**

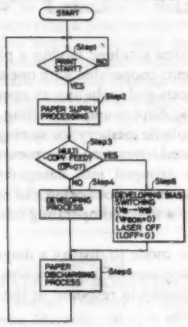
1. An image recording apparatus having:

a developer carrying member for guiding and supplying developer to a latent image on the surface of an image bearing member to cause the developer to adhere to said latent image;

means for supplying a bias voltage to said developer carrying member;

means for detecting the feed of multiple transfer mediums; and





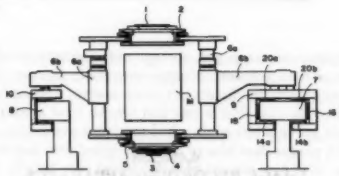
means for varying the bias voltage to said developer carrying member in response to the detecting operation of said multi-copy feed detecting means.

4,496,239

PROJECTION EXPOSURE APPARATUS

Junji Isohata, and Mitsuya Sato, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1982, Ser. No. 440,429
Claims priority, application Japan, Dec. 29, 1981, 56-215336
Int. Cl.³ G03B *27/52, 27/42, 27/32*
U.S. Cl. 355—30 **8 Claims**



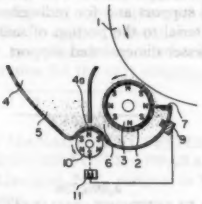
1. A projection exposure apparatus comprising:
negative holding means for holding a negative;
photosensitive member holding means for holding a photosensitive member;
a projection optical system for projecting an image of the negative upon the photosensitive member;
movable means for coupling said negative holding means and said photosensitive member holding means;
guide means for guiding said movable means in a scanning direction;
first compensating means for compensating for distortion of the image of the negative by said projection optical system by controlling the temperature of at least one of the negative and the photosensitive member; and
second compensating means for compensating for inclination of the posture of said movable means during the movement thereof and for compensating for distortion of the image of the negative on the photosensitive member.

4,496,240

APPARATUS FOR CONTROLLED DELIVERY OF MAGNETIC TONER

Keitaro Yamashita, Saitama, and Hiromi Kashiwagi, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Japan

Continuation of Ser. No. 298,172, Aug. 31, 1981, abandoned.
This application Oct. 17, 1983, Ser. No. 541,492
Claims priority, application Japan, Sep. 1, 1980, 55-120893
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D **3 Claims**



1. An apparatus for developing an electrostatic latent image by means of a single component magnetic toner, having a non-magnetic cylindrical sleeve disposed to oppose a surface of a photo-sensitive member, and a magnetic roll disposed in said sleeve and having a plurality of magnetic poles, said apparatus further comprising:
a container provided with developing tank means for receiving the magnetic toner to be supplied onto the non-magnetic cylindrical sleeve and for receiving any excess magnetic toner carried by said sleeve and not transferred to said latent image, said container further including toner supply tank means for holding a supply of the magnetic toner, said toner supply tank means being in communication with said developing tank means via a communication portion including a wall;
a doctor blade disposed at a toner outlet of said developing tank means and adapted to adjust the thickness of a layer of the magnetic toner conveyed to said latent image on said non-magnetic sleeve due to relative rotation between said non-magnetic sleeve and said magnet roll;
means for detecting the amount of the magnetic toner attracted onto said non-magnetic sleeve and for generating a signal in response to said detected amount, said detecting means being disposed in the developing tank means upstream of said doctor blade as viewed in the direction of conveyance of the magnetic toner;
rotating means for supplying the magnetic toner from the toner supply tank means to the developing tank means, said rotating means comprising a magnet roll with a plurality of magnetic poles provided on a surface thereof, and being disposed to control the flow of toner through said communication portion, said magnet roll positioned adjacent said communication wall and being rotatable in a predetermined direction to move the magnetic toner from said toner supply tank means to said developing tank means along said wall; and
means for actuating said rotating means in accordance with the signal generated by said detecting means, thereby controlling the delivery of the magnetic toner from said toner supply tank means to said developing tank means based on the amount of toner in said developing tank means.

4,496,241

PROCESS AND DEVICE FOR RELATIVELY ALIGNING THE IMAGE AND OBJECT SURFACES IN OPTICAL COPYING SYSTEMS

Herbert E. Mayer, Eschen, Liechtenstein, assignor to Censor Patent- und Versuchs-Anstalt, Vaduz, Liechtenstein

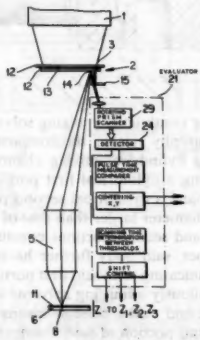
PCT No. PCT/AT80/00007, § 371 Date Oct. 14, 1980, § 102(e) Date Oct. 10, 1980, PCT Pub. No. WO80/01721, PCT Pub. Date Aug. 21, 1980

Continuation-in-part of Ser. No. 197,991, Oct. 10, 1980,. This PCT application Feb. 6, 1980, Ser. No. 476,249

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905635

Int. Cl.³ G01B 11/26

U.S. Cl. 356—152 8 Claims



1. A process for relatively aligning an object surface and an image surface in a projection-copying system, comprising the steps of:

providing a window with two parallel edges on said object surface;

providing a line mark parallel to said edges on an area of said image surface designed to coincide with an image of said window;

projecting an image of said window upon said area through a projection objective and a semitransparent mirror inserted between said object surface and said objective;

retroprojecting an image of the projected window image along with an image of said line mark by way of said objective and said semitransparent mirror upon a detection plane to form a composite image thereon;

scanning said composite image in a direction perpendicular to said line mark and said parallel edges, thereby generating electrical signals corresponding to the luminous intensity of the scanned image elements;

comparing a time interval elapsing between a first pulse and a second pulse, respectively representing a traverse of one of said edges and of said line mark, with a time interval elapsing between said second pulse and a third pulse, representing a traverse of the other of said edges, as a measure of the position of said line mark relative to said window;

relatively displacing said object and image surfaces to center the image of said line mark in the retroprojected image of said window;

determining the scanning time required for one of said pulses to pass between a predetermined lower and a predetermined higher intensity threshold as a measure of sharpness of focus; and

varying the distance between said object and image surfaces along the optical axis of said objective until said scanning time attains a minimum value.

4,496,242

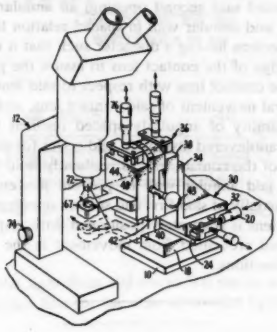
APPARATUS FOR POSITIONING A CONTACT LENS UNDER A RADIUSCOPE

John Clough, Clearwater, and Henry H. Hollidge, Seminole, both of Fla., assignors to Automated Optics, Inc., Clearwater, Fla.

Filed Dec. 22, 1981, Ser. No. 333,261

Int. Cl.³ G01N 21/01

U.S. Cl. 356—244 5 Claims



1. An apparatus for positioning the curved surface of a lens relative to a lens examining device to facilitate inspection of the entire lens surface, comprising:

a support base;

a first slide for providing linear translation along a vertical axis relative to said support base;

a support member affixed to said first slide so as to be rotatable relative to said slide about a horizontal pivot axis;

a second slide mounted on said support member and providing linear translation along a normally vertical axis perpendicular to said horizontal pivot axis; and

a lens support structure mounted on said second slide, the distance between said lens support structure and said horizontal pivot axis being variable by means of movement of said second slide along its axis of translation in accordance with the radius of curvature of a lens to be inspected so that a portion of the lens surface is always maintained in a fixed focal area with rotation of said support member about said horizontal axis.

4,496,243

CONTACT LENS HOLDER

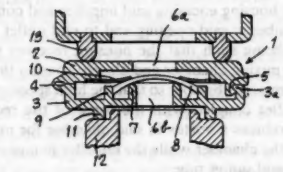
Takeshi Machida, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 363,153

Claims priority, application Japan, May 29, 1981, 56-78564[U]

Int. Cl.³ G01N 21/01

U.S. Cl. 356—244 2 Claims



1. A contact lens holder for use between the lens presser and lens support of a lens meter for measurement of a contact lens, comprising a cover and a casing which are openably joined to

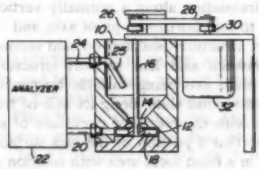
each other, said casing having a leg adapted to support said lens holder on the lens support of said lens meter, said cover and said casing having first and second aligned openings, respectively, for passage therethrough of a beam of light emitted from the lens meter, said casing having an annular wall which defines said second opening and has a diameter which is less than the diameter of the contact lens to be measured, said annular wall adapted to engage the concave side of the contact lens and support the contact lens with the concave side thereof directed toward said second opening, an annular projection surrounding said annular wall in spaced relation thereto, said annular projection having a diameter such that it engages the peripheral edge of the contact lens to assure the proper positioning of the contact lens with respect to said lens meter and prevent lateral movement of said contact lens, and said cover having a plurality of angularly spaced resilient tongues attached in a cantilevered fashion to said cover for engaging the convex side of the contact lens to resiliently hold the contact lens against said annular wall to prevent movement of the contact lens axially of said first and second openings, whereby said contact lens is accurately positioned with respect to said lens meter and prevented from movement in the vertical or horizontal directions.

4,496,244

SMALL VOLUME MIXING AND RECIRCULATING APPARATUS

Albert R. Ludwig, Holiday, Fla., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 17, 1983, Ser. No. 458,230
Int. Cl.³ B01F *7/02, 7/16, 15/02*
U.S. Cl. 366—136 **3 Claims**



1. A small volume mixing and delivery system for supplying small particles suspended in a vehicle so as to form a slurry for delivery and recirculation, comprising:

a mixing chamber having cylindrical sides, a conical bottom having an opening at its lowest point and a pivotable inlet tube adjustable to introduce recirculated slurry into said chamber in a manner to selectively enhance or diminish the establishment of a vortex in said chamber;

a high speed rotatable impeller;

an outlet tube;

an impeller housing encasing said impeller and connected to said chamber at said opening and to said outlet tube, said opening being such that the housing receives the slurry from the mixing chamber and closely couples the housing with the mixing chamber so that the high speed rotation of the impeller coupled with the force of the recirculated slurry produces a vortex in said chamber for mixing said slurry in the chamber while the impeller pumps said slurry through said outlet tube;

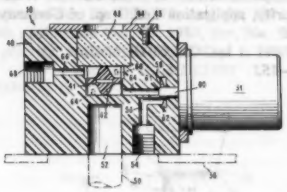
shaft means for rotating said impeller in said housing, said shaft means extending through said slurry to a point above the level of said slurry for connection to a power drive train arranged to drive said impeller.

4,496,245

LIQUID CHROMATOGRAPHY PROPORTIONING VALVE AND MIXER

Frederick L. Conrad, Poughkeepsie, N.Y.; Louis R. Palmer, Newtown, and Arthur A. Roberts, Danbury, both of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,903
Int. Cl.³ B01F *7/16, 13/08, 15/02*
U.S. Cl. 366—143 **11 Claims**



1. In a device for continuously mixing solvents flowing into a liquid chromatography system, the combination of:

a body having a cylindrical mixing chamber therein, said chamber having a cylindrical first portion of a constant first diameter and a cylindrical second portion of a constant second diameter larger than that of said first diameter, said first and second portions constituting the entire mixing chamber, said body further having inlet passage means communicating with said first portion of said chamber for continuously admitting solvents to be mixed into said chamber, and outlet passage means communicating with said second portion of said chamber for conducting solvents mixed in said chamber away therefrom and into said chromatography system; and

a magnetic star wheel stirrer rotatably disposed in and substantially filling said chamber, said stirrer being rotatable about an axis of said chamber, said star wheel stirrer extending through said first and second portions and being adapted to be driven by a rotary magnetic field, said star wheel stirrer having a central web and two spoked sections on either side of said web, one spoked section being disposed in said first portion for mixing solvents therein and the other spoked section being disposed in said second portion inwardly of said outlet passage means for mixing solvent in said second portion, said stirrer rotating in a cylindrical volume within said chamber which volume has a diameter slightly less than said first diameter, whereby the larger diameter of said second portion allows any gases in said mixing chamber to flow around said stirrer and outwardly through said outlet passage means without becoming entrapped in said other spoked section and blocking the flow of liquids through said device.

4,496,246

TIMEPIECE CONSTRUCTION

Tomio Ota; Mamoru Miyasaka, and Imao Hiraga, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,109
Claims priority, application Japan, Oct. 21, 1980, 55-147448; Nov. 7, 1980, 55-157192
Int. Cl.³ G04B *00/00*
U.S. Cl. 368—88 **10 Claims**

1. An electronic wristwatch driven by a stepping motor comprising:

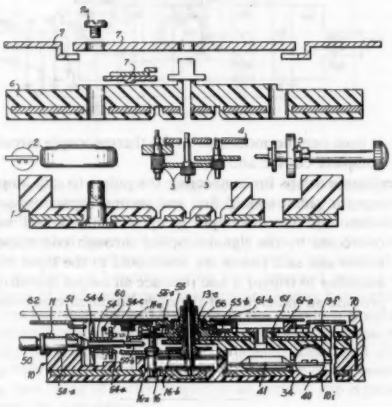
at least a first frame and a second frame, said first and second frames being formed of metal plates with plastic layers integrated to said metal plates, said plastic layers being substantially separated, in a plan view, into concave and convex portions, the concave and convex portions at each said separated plan view portion being adapted to mount

components substantially of a functional block of said wristwatch;

a gear train including a rotor portion of said stepping motor for driving said display, said gear train being positioned between said first and second frames;

a ring-shaped date dial and a date dial guard disposed between a dial and one of said first and second frames; said date dial guard supporting said ring-shaped date dial, said dial guard being a metal plate, said first and second frames and said date dial guard each having a hole, said holes being concentric;

a threaded tube fixed in the concentric hole of the other one of said first and second frame;



a bridge screw passing through said concentric holes from the side of said dials to engage said threaded tube, said first and second frames and said date dial guard being supported together in common by said bridge screw when said gear train and said rotor are arranged on the concave portion of said plastic layer, at least a part of the convex portion being used as a spacer between said two frames, the heads of said threaded tube and said bridge screw being respectively overlapped with the metal plate in the frame and the metal of the dial guard so that the axial forces created by the bridge screw are supported by the metal of the frame and dial guard.

4,496,247

DISPLAY DEVICE WITH TRANSPARENT COVER AS A VIBRATOR OF A SOUND GENERATOR

Akio Kumada, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

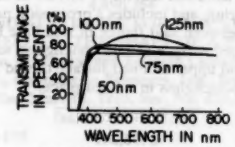
Division of Ser. No. 199,231, Oct. 21, 1980, abandoned. This application Dec. 30, 1982, Ser. No. 454,531

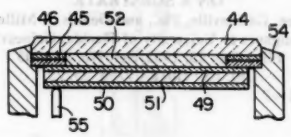
Claims priority, application Japan, Oct. 22, 1979, 54-135170; Oct. 22, 1979, 54-135171; Oct. 24, 1979, 54-136402; Oct. 24, 1979, 54-136405

Int. Cl.[3] **G04C** *21/16*

U.S. Cl. 368—255 **8 Claims**

1. A display device having a transparent cover serving as a vibrator of a sound generator, said transparent cover having a transparent piezoelectric element coated with transparent electrodes on both surfaces thereof, bonded to an inner surface of said transparent cover by transparent adhesive material, said transparent cover being arranged in front of a display panel of said display device, wherein each of said transparent electrodes has a thickness in the range from 75 nm to 125 nm, which corresponds to one quarter of the wavelength of the





near ultraviolet light from 300 nm to 500 nm so as to serve as an anti-reflection film for the near ultraviolet light.

4,496,248

STRUCTURE FOR A WATCH CASE MADE OF CEMENTED CARBIDE

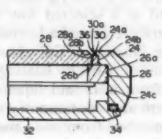
Masahiko Waki; Seiji Umezawa; Tsuneji Takasugi; Hiroshi Koide, and Takao Kasai, all of Tokyo, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

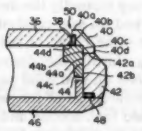
Filed Jan. 26, 1982, Ser. No. 342,749

Claims priority, application Japan, Feb. 20, 1981, 56-23200; Jul. 16, 1981, 56-106475

Int. Cl.[3] **G04B** *37/00*

U.S. Cl. 368—280 **3 Claims**





1. A structure for a watch case made of cemented carbide, comprising:

a watchglass having an outer peripheral surface formed with a vertical portion and an upper inclined surface formed at a portion above said outer peripheral surface;

a case band composed of a cemented carbide alloy, said case band having an inwardly projecting ring-shaped flange formed at an upper portion thereof, an inwardly facing annular step formed at a lower portion of said inwardly facing annular surface;

a watch glass supporting ring composed on an alloy consisting of iron and nickel, said watchglass supporting ring having an outer diametrical surface brazed to said annular step of said case band and an upper surface for supporting a bottom surface of said watchglass;

a packing for providing a waterproof seal; and

a back cover secured to said case band;

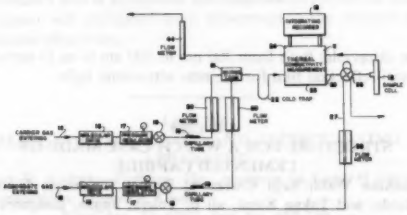
wherein said packing is provided and compressed between said outer peripheral surface of said watchglass and an annular groove formed by said flange and annular surface of said case band and said upper surface of said watchglass supporting ring, and includes a protrusion protruding into the space between said flange of said case band and said upper inclined surface of said watchglass, said protrusion engaging said upper inclined surface of said watchglass to retain said watchglass in a fixed place.

4,496,249

METHOD AND APPARATUS FOR DETERMINING RELATIVE SURFACE AREAS OF A COATED MATERIAL ON A SUBSTRATE

Hong H. Lee, Gainesville, Fla., and Dennis J. Miller, Haslett, Mich., assignors to University of Florida, Gainesville, Fla.

Filed Sep. 23, 1982, Ser. No. 421,905
Int. Cl.³ G01K *17/06, 25/22*
U.S. Cl. 374—7 **10 Claims**



1. A method of determining the proportion of the surface area of a solid support that is covered by a catalytic material which comprises passing a known volume of an adsorbate gas under controlled steady-state conditions of pressure, temperature, and flow rate, over a catalyst material deposited on a solid support maintained at a selected low temperature near the liquefaction temperature of said adsorbate gas and determined first the desorption kinetics of the adsorbate gas adsorbed on said catalyst and said support by heating said catalyst material and said support from near said liquefaction temperature to ambient temperature and continuously measuring the volume of adsorbate gas desorbed from said catalyst material and from said support so as to generate data representing the volume of adsorbate gas adsorbed as a function of temperature; in a similar fashion determining secondly the desorption kinetics of said adsorbate gas adsorbed on said catalyst in the absence of said solid support at the same range of temperatures; in a similar fashion determining thirdly the desorption kinetics of said adsorbate gas adsorbed on said solid support in the absence of said catalyst at the same range of temperatures; comparing the above-determined said first, second and third desorption kinetics of adsorbate gas over identical temperature ranges and calculating therefrom the proportion of surface area of said catalyst material deposited on a solid support that is covered by said catalyst material.

4,496,250

THERMOCOUPLE OPEN CIRCUIT DETECTOR

Thomas J. Walsh, Hatboro, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 3, 1983, Ser. No. 471,914
Int. Cl.³ G01K *01/02;* **G01R** *31/02*
U.S. Cl. 374—186 **1 Claim**

1. In an apparatus for detecting an open circuit condition in at least one thermocouple circuit selectively connected to a measuring input circuit, the improvement comprising:

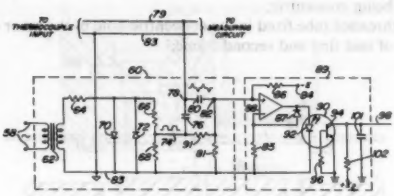
a pulse generator for generating pulses;

a first capacitor connecting said generator to said thermocouple circuit at a junction so that said pulses are conducted through said thermocouple circuit when it is a complete circuit;

an amplifier;

a second capacitor connecting said junction to the input of said amplifier;

a voltage divider means connected at its tap to the input of said amplifier so as to produce a bias of polarity and magnitude to maintain the amplifier output cut off when noise signals appear in the thermocouple circuit and when said



at least one thermocouple in the thermocouple circuit is a complete circuit; and

resistance means for connecting the pulses to said amplifier input in shunt to said first and second capacitors so that when said thermocouple is open-circuited said bias is overcome by the signal supplied through said resistance means and said pulses are conducted to the input of said amplifier to trigger it and produce an output therefrom to provide an indication of the open-circuited condition.

4,496,251

PAD-TYPE HYDRODYNAMIC BEARING

Russell D. Ide, P.O. Box 744, Coventry, R.I. 02816

Filed May 14, 1984, Ser. No. 610,140
Int. Cl.³ F16C *32/06*
U.S. Cl. 384—117 **6 Claims**

1. A hydrodynamic bearing supporting an opposing moving part, a plurality of bearing pads, each pad having a face member and a support member, said pad being separated from said support member and by a plurality of web-like ligaments, the face of said pad having a load-engaging surface, said pad under the action of friction on the face thereof rocking to cause the trailing edge to approach the member being supported in bearing relationship.

4,496,252

RESILIENT SUPPORT ARRANGEMENT FOR SHAFT BEARINGS OF HIGHSPEED ROTORS, IN PARTICULAR ROTORS OF TURBO MACHINES

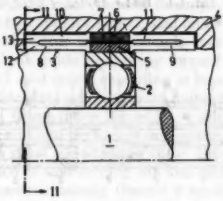
Hansulrich Hörler, Zurich, and Rudolf Koller, Hochdorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 20, 1983, Ser. No. 486,867

Claims priority, application Switzerland, May 26, 1982, 3223/82

Int. Cl.³ F16C 27/04

U.S. Cl. 384—215 8 Claims



1. A resilient support arrangement for shaft bearings of high-speed rotors, said support arrangement being intended to resiliently absorb forces acting from the rotor upon the shaft bearing located transversely to an axis of a rotor shaft, said support arrangement including an inner strap, an outer strap and a plurality of bending spring bars arranged around the periphery of said two straps, said bending spring bars extending from end faces of said two straps in a direction generally parallel to a common longitudinal axis of the two straps, said bending bars having free ends, associated inner and outer spring bars being joined together at their free ends, the bending spring bars being of such a shape that an annular gap is present between the two straps.

4,496,253

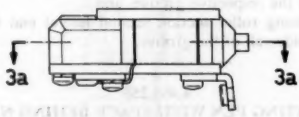
IMPACT HAMMER

Gijsbertus B. Morsing, Heumen, Netherlands, assignor to Daisy Systems, Holland B.V., Netherlands

Filed Apr. 20, 1983, Ser. No. 486,696

Int. Cl.³ B41J 9/38

U.S. Cl. 400—163.1 4 Claims



1. An electromagnetic hammer assembly comprising:

a hammer element having a hammer tip;

control means for guiding said hammer element in reciprocating movement between a rest position and a striking position;

means for selectively producing an electric field for urging the hammer element from said rest position toward said striking position;

a return spring for biasing said hammer element toward said rest position; and

a bumper assembly delimitting said rest position and adapted to debounce said hammer element as it is returned from said striking to said rest position, said bumper assembly comprising a housing, a stationary shock absorbing element affixed to said housing and two rigid pieces, each having a weight equal to the hammer element weight, said rigid pieces being positioned on two opposed sides of said shock absorbing element and movable with respect to said housing and each other to absorb the kinetic energy of said hammer element after each collision between said hammer element and one of said rigid pieces.

4,496,254

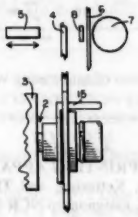
METHOD AND APPARATUS FOR MOUNTING A DAISY PRINT WHEEL ON THE SHAFT OF A PRINT HEAD

Edward H. Lau, Westbury, and Kenneth Colonel, Ronkonkoma, both of N.Y., assignors to Primages, Inc., Bohemia, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,502

Int. Cl.³ B41J 1/60

U.S. Cl. 400—175 25 Claims



1. Apparatus for attaching a print wheel to an angular drive means, said apparatus comprising a hub fixed to the print wheel and engagable in driving relation with the angular drive means such that rotation of the drive means imparts corresponding rotation to the print wheel, and holder means on said hub to secure the hub on the angular drive means in said driving relation, said holder means and hub being cooperatively constructed and arranged to provide interference engagement therebetween with resilient deformation in a locked position of said holder means and hub with said hub engaged in driving relation with said drive means whereas in an unlocked position the resilient deformation is released and the holder means and hub are removable from the drive means, said hub comprising a collet means, said holder means comprising a cap including sleeve means lockably engageable on the collet means with interference engagement and resilient deformation to secure the hub on the drive means, said drive means comprising a drive shaft with splines thereon, said collet means including angular segments of cantilever formation engaged between the splines of the drive shaft with interference fit when the sleeve means is lockably engaged on the collet means in interference engagement.

4,496,255

INVERTIBLE MULTIPLE-PASS RIBBON CARTRIDGE HAVING TWO CAPSTANS

David R. Meintrup, Affton, and Janis Dumpis, St. Ann, both of Mo., assignors to NEC Corporation, Tokyo, Japan

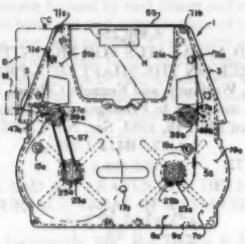
Filed Sep. 4, 1980, Ser. No. 184,098

Int. Cl.³ B41J 32/00

U.S. Cl. 400—208 14 Claims

1. A ribbon cartridge for use in a serial printer, said cartridge comprising a casing having two opposed broad faces, two ribbon spools in said casing, and an inked ribbon wound on said spools and including a reach extending out of said casing between said spools for engagement by a print head in the serial printer, characterized in that said cartridge further comprises two capstans spaced from said spools, said capstans being spaced laterally apart from one another, one of said capstans being associated with each of said ribbon spools for alternatively advancing said ribbon toward its associated spool, first means on a first of said capstans for interconnection with a drive means in the printer to transmit rotational power through a first of said broad faces of said casing, and second means on

the second of said capstans for interconnection with the drive means in the printer to transmit rotational power through the



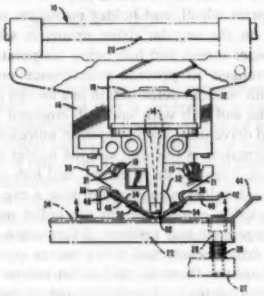
second of said broad faces of said casing when said cartridge is inverted.

4,496,256

IMPACT PRINTING APPARATUS

Harold L. McMorrow, Kettering, and Theodore T. Trzaska, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 29, 1983, Ser. No. 480,050
Int. Cl.³ B41J *35/26*
U.S. Cl. 400—248 **9 Claims**



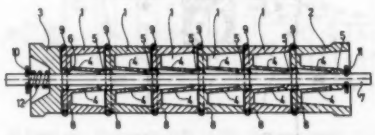
1. Printing apparatus comprising:
platen means for supporting record media for printing:
printing means comprising a plurality of impact printing elements and a frame for mounting said printing elements for reciprocating printing movement;
means for maintaining a predetermined distance between said platen means and said printing means during a printing operation;
ribbon guide means secured to said printing means for guiding a printing ribbon into cooperative relation between the ends of said print elements and the platen means on which record media may be positioned for printing;
ribbon mask support means secured to said printing means;
ribbon mask means secured adjacent one end thereof to said ribbon mask support means and slidingly coupled to said support means adjacent the other end of said ribbon mask means, said ribbon mask means being positioned to receive the printing ribbon between said mask means and the ribbon guide means, and having an aperture therein to accommodate movement therethrough by the printing elements;
a cam surface on the ribbon mask support means comprising an angled extension thereof; and
a cam surface on the platen means comprising a planar element secured at an end of the platen means and disposed at an angle to the reciprocating direction of movement of the platen means for cooperative engagement with the angled extension of the ribbon mask support means to increase the predetermined distance between the printing means and the platen means at the end of a printing line, whereby printing ribbon insertion is facilitated.

4,496,257

TRANSPORT ROLLER FOR A RECORD CARRIER IN A PRINTER

Gerhard Habelt, and Franz Mucha, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 403,174, Jul. 29, 1982, abandoned. This application Jan. 17, 1984, Ser. No. 571,401
Int. Cl.³ B41J *13/02, 15/02*
U.S. Cl. 400—578 **8 Claims**



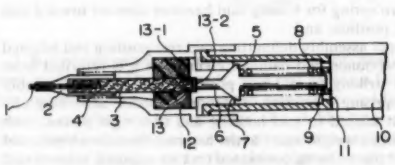
1. A transport roller for a record carrier in a printer, comprising a plurality of toroidal rings spaced axially from one another along the longitudinal axis of the roller, and a ring support having a corresponding plurality of circumferential grooves, each ring being arranged in a respective groove, characterized in that
the roller further comprises a shaft, and
said ring support comprises a corresponding plurality of laterally adjoining, mainly hollow, cylindrical roller sections having first and second lateral ends, a hub portion and a carrier portion,
each hub portion has an axial hole therethrough through which the shaft is fitted for locating each of said sections radially and locking the hub portion against relative rotation with respect to the shaft,
each carrier portion extends between the hub portion and the first lateral end,
the first lateral end of each roller section has an inwardly extending groove about the circumference, the groove having a sidewall at the groove side toward the second lateral end, and being open toward the first lateral end, said ring arranged in each groove being positioned radially by the respective groove, and
the adjoining roller section second lateral end forms the other sidewall of the groove.

4,496,258

WRITING PEN WITH SPACE BEHIND NIB

Isao Tanaka, and Takao Inaba, both of Aichi, Japan, assignors to Pilot Ink Co., Ltd., Aichi, Japan

Continuation of Ser. No. 311,356, Oct. 14, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 499,026
Claims priority, application Japan, Oct. 17, 1980, 55/148604[U]
Int. Cl.³ B43K *8/02, 5/08*
U.S. Cl. 401—206 **1 Claim**



1. A writing pen wherein a valve element is operated to

supply a writing nib in a pen holder with ink from an ink reservoir, the improvement comprising:

a holder formed with a small bore in its front end and a large bore in its rear end, said bores in communication with each other and axially aligned;

said writing nib formed of synthetic resin having an outer diameter of not more than 2 mm and having an axially extending ink passage bored through its interior, said small bore supporting said writing nib with the tip thereof protruding therefrom; and

an ink guide stem between said writing nib and said valve element, said ink guide stem formed of porous resin-treated fiber material and adapted to receive the ink flowing from said ink reservoir and to supply said ink to said writing nib by capillary action, said large bore supporting said ink guide stem which extends rearward from said holder, said ink guide stem being formed with a recess at its front end, said recess extending in an axial direction of said ink guide stem and having an inner diameter substantially equal to an outer diameter of said writing nib to receive the rear end portion of said writing nib, said recess providing a small ink-retaining space defined between the rear end face of said writing nib and said ink guide stem for temporarily retaining therein a small amount of ink that exceeds the ink retaining capacity of said ink guide stem.

4,496,259

CONNECTOR FOR CONNECTING TWO ROTORS TOGETHER

Gérard Foucher, Tremblay les Gonesse, France, assignor to Alsthom-Atlantique, Paris, France

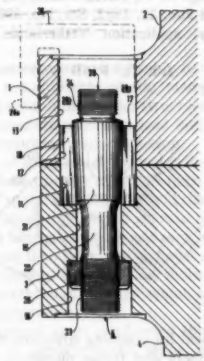
PCT No. PCT/FR81/00065, § 371 Date Nov. 30, 1981, § 102(e) Date Nov. 30, 1981, PCT Pub. No. WO81/03529, PCT Pub. Date Dec. 10, 1981

PCT Filed May 19, 1981, Ser. No. 328,542

Claims priority, application France, May 28, 1980, 80 11779

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—14 **2 Claims**



1. A connector for connecting two rotors together, said connector comprising a plate at the end of each rotor ending, each plate having a plurality of orifices disposed around its circumference, the orifices of one plate being adjacent respective orifices of the other plate, fixing components inserted in said orifices to connect the plates together, said fixing components being of a first type and of a second type, said fixing components of the first type each being constituted by a clamping bolt whose dimensions allow it to enter with play into an orifice before machining, said adjacent orifices receiving the fixing components of the second type and being provided with precision-reamed bores of the same cross-section obtained by reaming adjacent orifices, said adjacent orifices located one facing another when the clamping bolts are in place, each fixing component of the second type having firstly a pair of sleeve parts which are conical on the inside, and secondly a shank which has firstly a conical portion which pushes the sleeve parts against the walls of the precision-reamed bores, secondly a threaded portion at one end bearing a nut screwed onto it, said nut fixing the shank in position and thirdly an end which allows gripping, and wherein the sleeve parts are two parts having an axial plane of separation formed by longitudinal sawing, each of said sleeve parts being slightly smaller than a half cylinder, and said connector further comprising means for initially positioning and maintaining said two parts spaced equally apart circumferentially prior to screwing down said nut on said shank threaded portion so that when in position, the two parts of the sleeve are maintained in their spaced apart positions.

4,496,260

DEVICE FOR THE CONNECTION OF TWO STRUTS BY INSERTING A SUPPORT BETWEEN AND VERTICALLY TO THEM

Oswald Brunn, Bunzlauer Platz 1, D-8000 Munich 50, Fed. Rep. of Germany

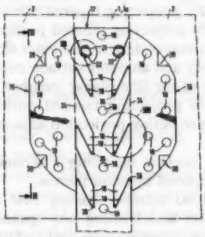
PCT No. PCT/EP81/00207, § 371 Date Aug. 26, 1982, § 102(e) Date Aug. 26, 1982, PCT Pub. No. WO82/02578, PCT Pub. Date Aug. 5, 1982

PCT Filed Dec. 29, 1981, Ser. No. 414,244

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3102027

Int. Cl.³ F16B *7/22*

U.S. Cl. 403—189 **14 Claims**



1. A device for connecting the ends of two horizontal struts each in abutment with a corresponding contact surface of a vertical post comprising:

a pair of strut plates one attached to each of said struts within a slit extending lengthwise along a portion of the strut, each of said strut plates having a first connecting means on an abutting side adjacent to the abutting end of the strut; and,

a post plate attached to said vertical post and mounted within a slit extending continuously through said post from one of said contact surfaces to the other of said contact surfaces, said post plate having a second connecting means on opposite abutting sides adjacent to where each of said struts abuts said post;

one of said first and second connecting means comprising at least one tooth extending outward from an abutting side of one of said plates and slanting downward with the upper and lower flanks of said at least one tooth converging in a wedge shape,

the other of said first and second connecting means comprising at least one pocket extending inward from an abutting side of another of said plates and slanting downward with the upper and lower flanks of said at least one pocket converging in a wedge shape,

the upper flank of each tooth and the upper flank of each pocket having a lower steeper part and an upper less steep part such that the lower part encloses a relatively large

angle and the upper part encloses a comparatively smaller angle relative to the opposing lower flank,

and the wedge shape and length of each tooth relative to the wedge shape and length of each corresponding pocket providing a gap at the bottom of the pocket adjacent to the lower end of the tooth so that each of the struts abuts the post and the flanks of the tooth are prestressed by contact with the flanks of the pocket when the tooth is wedged into the pocket.

4,496,261

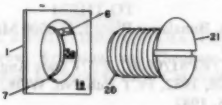
COLUMN/SHEET METAL INTERFACE

Samuel Cohen, Massapequa Pk., and Edward F. Wisser, Port Jeff Sta., both of N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Jun. 12, 1981, Ser. No. 272,847

Int. Cl.³ F16B *39/00*

U.S. Cl. 403—320 **8 Claims**



1. An apparatus comprising:

(a) a housing having opposing first and second portions,

said first portion including a first planar member with an inner side and an outer side,

said first portion having a first opening therein defined by an inwardly projecting tapered portion,

said inwardly projecting tapered portion having an inner surface corresponding to the inner side of the first planar member and an outer surface corresponding to the outer side of the first planar member,

said inwardly projecting tapered portion having a first inwardly projecting porjection adjacent said first opening, and

said second portion including a second planar member having a second opening therein;

(b) a longitudinal member having first and second ends located within said housing and spanning between said first and second openings, the first end of said longitudinal member for engaging the inner surface of the inwardly projecting tapered portion, the first end having a first indentation therein for engaging said first projection;

(c) first means interconnecting the first end of said longitudinal member and said first portion via said first opening whereby said first end engages the inner surface and said first indentation engages said first projection; and

(d) second means interconnecting the second end of said longitudinal member and said second portion via said second opening.

4,496,262

LINKING MEANS

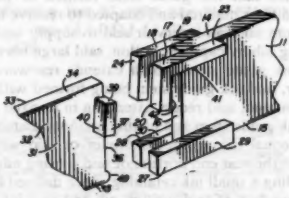
George G. Sangster, 1719 E. Claremont, Phoenix, Ariz. 85016

Filed Jun. 1, 1982, Ser. No. 383,676

Int. Cl.³ F16B *5/07*

U.S. Cl. 403—335 **16 Claims**

1. A quick disconnect linking device for joining two adjacent discrete members to each other comprising: a first member and a second member said first member having a body portion having a front and rear surface, an upper and lower edge extending between said surfaces, and a leading edge extending between said upper and lower edge and between said surfaces; a first pair of outwardly extending flanges respectively secured one to each of said surfaces adjacent said upper edge, each of said first pair of flanges being disposed in spaced registered relationship to the other flange of said pair and having an axially extending body portion and an end portion formed integrally with said body portion and angularly disposed thereto and defining an interior angle therewith of approximately 115–125 degrees, said end portion being disposed in spaced relationship to said leading edge and defining a gap therebetween; and a second pair of outwardly extending flanges respectively secured, one to each of said surfaces adjacent said lower edge in spaced relationship to said first pair of flanges, each of said second pair of flanges being disposed in spaced registered relationship to the other flange of said pair and having an elongated body portion extending outwardly



beyond said leading edge approximately the same distance as does said end portion of each of said first pair of flanges and adapted to sandwich a portion of said second member therebetween; and said second member having a pair of flanges integrally formed therewith in spaced registered relationship to each other and adapted, when said first member is brought into axially aligned physical proximity to said second member, to engage and support the corresponding one of said first pair of flanges on said first member while fitting between said second pair of flanges on said first member.

4,496,263

COUPLING DEVICE FOR COUPLING PANELS AND LIKE STRUCTURAL MEMBERS

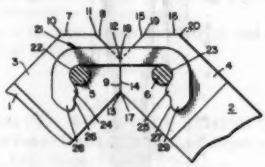
Franciscus L. Laarhoven, The Hague, Netherlands, assignor to Laarhoven Design B. V., Zoeterwoude, Netherlands

Filed Jun. 22, 1982, Ser. No. 390,899

Claims priority, application Netherlands, Jun. 23, 1981, 8103030

Int. Cl.³ F16B *5/06*

U.S. Cl. 403—402 **6 Claims**



1. An arrangement for coupling structural members, such as panels, wall members and frame members, in edge-to-edge relationship, the arrangement comprising:

a coupling member for cooperating with at least two edges to be connected to lock the structural members together;

at least one coupling pin provided in each of the structural members to be coupled, said coupling pin having an axis extending longitudinally substantially along an edge of an associated structural member and being spaced inwardly thereof, said edge being formed with faces arranged radially exterior of said axis of said coupling pin and forming an odd number of successive chord planes of an imaginary cylinder having an axis which coincides with that of said coupling pin, the middle one of said chord planes forming a perpendicular end face of the structural member, with the remaining planes forming faces that extend symmetrically on both sides thereof at one and the same angle to the

adjacent face, and with each face being provided with longitudinal grooves; and

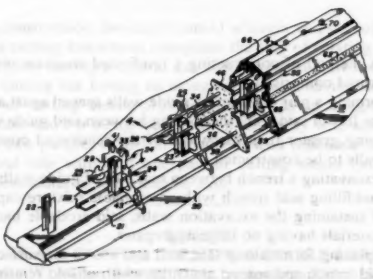
said coupling member being provided with clip-on means for engaging around at least two adjacent coupling pins, for holding two adjacent edge faces in contact with each other, and fixing the structural members with respect to each other, said coupling member having a substantially U-shaped body in cross section formed by a web portion and two legs, and said clip-on means comprising a pair of clip-on recesses for engaging respective coupling pins of two of said structural members, each clip-on recess being formed at the inside corner of the junction between the web portion and a respective one of the legs, a locking projection on the inner surface of each leg adjacent to the respective clip-on recess, and a pair of inner faces located at the free edges of the legs, the pair of inner faces being spaced apart by a distance at least equal to the spacing of the clip-on recesses to facilitate mounting the clip-on members onto said coupling pins.

4,496,264

BARRIER STRUCTURE

Steven M. Casey, 102 Monroe Dr., Harleysville, Pa. 19438

Filed Apr. 1, 1982, Ser. No. 364,411
Int. Cl.³ E01F *15/00*
U.S. Cl. 404—6 **31 Claims**



1. A hollow barrier structure assembly for receiving into its hollow interior a solidifiable plastic material which when solidified forms a monolithic barrier structure integral with the hollow barrier structure assembly, said hollow barrier structure assembly comprising in combination,

(a) a plurality of form plates having spaced apart sides and the major plane of each of which form plates is oriented transversely to the running length of the barrier assembly, said form plates being spaced apart at intervals along the length of the barrier assembly and each having a cross-sectional area less than the cross sectional area of the barrier structure assembly interior, and including at least one aperture therethrough through which solidifiable, plastic material is penetrable,

(b) a pair of spaced apart pre-formed thin walled opposite side panels of predetermined shape and length fixedly securable to said form plates and extending longitudinally along the sides of said form plates to form a substantially dimensionally stable assembly, said side panels having upper edges and lower edges with said lower edges being substantially seatable against the underlying surface over which said barrier structure assembly is supported,

(c) means for releasably intersecuring said form plates and side panels,

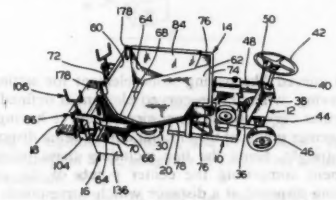
(d) reinforcing rods extending longitudinally within said barrier structure transversely to and through the major plane of said form plates, and means for mechanically interengaging said reinforcing rods with said form plates, whereby, said form plates and side panels when intersecured as aforesaid form a hollow barrier structure into which solidifiable plastic material may be poured and retained to form a continuous plastic mass between said side panels around said reinforcing rods and on both sides of said form plates, which mass when solidified locks said form plates and reinforcing rods therewithin between said side panels.

4,496,265

COMPACT ASPHALT LAYING MACHINE FOR SIDEWALKS AND THE LIKE

Joseph V. Fragale, 93 Chestnut Hill Rd., Torrington, Conn. 06790

Filed Jan. 28, 1983, Ser. No. 461,941
Int. Cl.³ E01C *19/18*
U.S. Cl. 404—110 **5 Claims**



1. In a self-propelled paving machine, the combination including:

A. a wheel-mounted body comprised of

(1) a main body portion, and

(2) a steering assembly disposed forwardly of said main body portion and comprising a first pair of laterally aligned wheels, said assembly including means for permitting independent pivotable movement of said first pair of wheels relative to said main body portion about a longitudinal axis;

B. drive means mounted on said main body portion for propelling said machine;

C. a gravity-fed hopper mounted in fixed position on said main body portion, said hopper having forward, rearward and sidewall components and a transversely extending discharge opening in the bottom portion thereof, the upper edge portions of said forward and rearward components lying substantially on a common plane, and the sidewall components thereof being indented downwardly from said plane to provide areas on both sides of said hopper dimensioned and configured to provide access and support for wheelbarrow loading, said hopper also having a panel disengageably mounted on each of said sidewall components closing said access area thereof and providing upper edge portions lying substantially on said common plane;

D. a second pair of wheels transversely aligned on said main body portion and positioned beneath said hopper in close proximity to said discharge opening thereof, said wheels being operatively connected to said drive means; and

E. a screed assembly mounted at the rear of said hopper for pivotable movement about a transverse axis therethrough, said screed assembly lying substantially behind said discharge opening and having a member for forming the paving material as it is discharged from said machine.

4,496,266

CURVED LIKE PAVING STONE ELEMENT FOR USE IN SETTING A CURVED PAVING

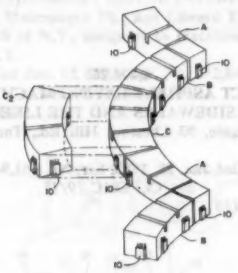
Willi Ruckstuhl, Kloten, Switzerland, assignor to Kronimus & Sohn GmbH & Co. KG, Iffeshein, Fed. Rep. of Germany, a part interest

Filed Dec. 6, 1982, Ser. No. 446,987

Claims priority, application Switzerland, Dec. 30, 1981, 3151876

Int. Cl.³ E01C *5/00*

U.S. Cl. 404—41 **6 Claims**



1. In a curved like paving stone element for setting of a curved paving, wherein the curved element is defined by an outer circular curve and an inner circular curve having equal radii, the center points of the circular curves being disposed on a radial straight, being the line including these points, the improvement comprising the center points of the circular curves being disposed at a distance which corresponds to the largest width of the curved element, the curved element including two outer stones and a center stone of about the same curvature length, the outer stones having upper surfaces subdivided into three segments and the center stone having an upper surface subdivided into at least two segments, said subdivisions formed by means of grooves, wherein the curved element is asymmetrically offset with respect to the radial straight in such a manner that the outer edge of an outer stone is similar than the opposing outer edge of the other outer stone, the size of the offset corresponding to about the width of the individual stone having the smaller outer edge, whereby a second curved element having an outer stone corresponding to the outer stone of the first curved element can be positioned adjacent to said first curved element so that its outer stone is located in said offset.

4,496,267

LIME OR LIME:FLY ASH PRETREATED PAVEMENT CONSTRUCTION MATERIAL AND METHOD

John P. Gnaedinger, Kenilworth, Ill., assignor to John P. Gnaedinger Research Corporation, Kenilworth, Ill.

Filed Dec. 16, 1982, Ser. No. 450,560

Int. Cl.³ E01C *19/00;* **C04B** *7/14, 1/00, 7/34*

U.S. Cl. 404—82 **6 Claims**

1. In a method for the formation of a pavement construction wherein a base course is disposed in overlying relationship with respect to a subgrade, the improvement comprising a method for forming said base course, said method comprising the steps of reacting uncompacted incinerator ash for several days with 2–10% by weight of a pretreatment agent consisting essentially of lime, adding a binding mixture consisting essentially of 2–10% by weight lime and 20–25% by weight water, and disposing the mixture over said subgrade, said incinerator ash comprising the product achieved by burning refuse in an incinerator at a temperature between 1600 and 2000° F. to form a residue wherein the incinerator ash recovered from the incinerator is sifted prior to use through a ¾ inch to 1 inch screen, the resulting ash having a typical particle size distribution wherein 60 to 90% of the ash passes through a No. 4 screen, 10 to 30% of the ash passes through a No. 30 screen, 2 to 12% of the ash passes through a 100-mesh screen, and 1.5 to 8% will pass through a 200-mesh screen, wherein the base course formed from said mixture is permitted to stand prior to actual use, and wherein a reaction between the lime and residue content of said incinerator ash takes place during such period.

4,496,268

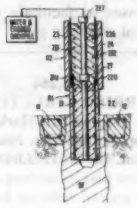
METHOD AND APPARATUS FOR CONSTRUCTING REINFORCED CONCRETE WALLS IN THE EARTH

Arturo L. Ressi di Cervia, New York, N.Y., assignor to Finic, B.V., Rotterdam, Netherlands

Filed Mar. 1, 1983, Ser. No. 471,100

Int. Cl.³ E02D *5/18;* **E21D** *1/00, 5/00*

U.S. Cl. 405—133 **9 Claims**



1. A method of constructing a reinforced concrete wall in the ground comprising:

I. forming a pair of concrete guide walls spaced apart along the line of said wall, the spacing between said guide walls being greater than the width of the reinforced concrete walls to be constructed,

II. excavating a trench between said pair of guide walls and backfilling said trench with an erodable mixture capable of sustaining the excavation walls, said erodable backfill materials having no large aggregates,

III. placing forms along said wall and above the surface of said trench and spaced apart the width of said reinforced concrete walls, installing steel reinforcement between said forms and casting concrete between said forms from the surface of said erodable mixture and filling said forms to thereby form an initial concrete wall section,

IV. after the concrete has set in said initial concrete wall section, injecting a fluid material below said initial concrete wall section to erode said backfill and removing the eroded backfill material and injected fluid from below said concrete wall section, lowering said initial concrete wall section into the trench while eroding said erodable backfill materials, said initial concrete wall section being lowered to a level wherein a portion thereof projects above the ground,

V. forming at least one further wall section directly on said first wall section by placing forms therealong, and

VI. after the concrete has set in said at least one further concrete section, lowering the said sections while eroding said backfill material below said initial concrete section to the bottom of said trench.

4,496,269

POLYMERIC BELT CUTTING APPARATUS AND METHOD OF MAKING SAME

G. Brian Hetz, 1733 E. Holiday, Springfield, Mo. 65807

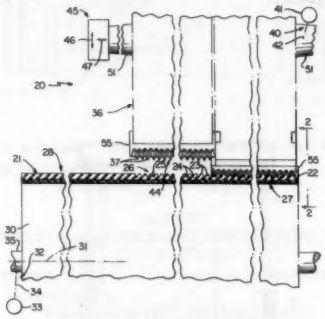
Filed May 26, 1981, Ser. No. 267,189

Int. Cl.³ B23C *3/04;* **B29H** *7/22*

U.S. Cl. 409—132 **11 Claims**

1. In a method for cutting a non-contoured and cured polymeric belt sleeve to define an endless power transmission belt construction having at least one pair of opposed non-parallel side portions, said method comprising the steps of disposing

said belt sleeve on a mandrel for supporting said belt sleeve for rotation about a longitudinal axis, rotating said mandrel and belt sleeve about said longitudinal axis, rotating a cutting instrument having at least one pair of substantially identical symmetrically arranged and outwardly diverging integral cutting means for cutting said pair of side portions, and cutting said belt sleeve by moving said rotating cutting instrument toward said sleeve to urge said cutting instrument during rotation thereof against the rotating belt sleeve to define said



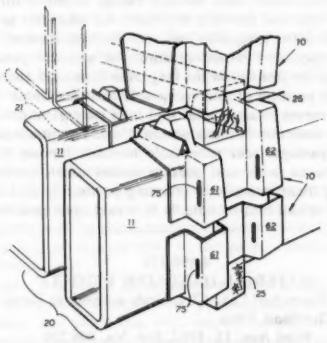
belt construction, the improvement wherein said step of rotating a cutting instrument comprises the step of rotating a support body having a central axis and having at least one rake-like cutting bar having an elongate axis and having said one pair of cutting means provided thereon as an integral part thereof, said bar being supported on said body with said elongate axis parallel to and in radially spaced relation from said central axis with said one pair of cutting means extending perpendicular to said elongate axis.

4,496,270

CHAIN CAP FOR FORMING A STABLE LOAD

Curtiss W. Miller, Marne, Mich., assignor to Urban Systems Streetscape, Inc., Grand Rapids, Mich.

Filed Sep. 20, 1982, Ser. No. 422,456
Int. Cl.³ B60P *7/12*; B65D *81/00*
U.S. Cl. 410—32 **15 Claims**



1. A chain cap for forming a stable load suitable for vehicular travel comprising:

a body;

interfitting surfaces disposed on said body, said interfitting surfaces interlocking to prevent lateral movement thereof when a plurality of said chain caps are stacked one atop the other;

a tie bar surface disposed on said body for defining a channel for receiving tie bars when a plurality of said chain caps are arranged in a side-by-side relationship;

a conformal surface disposed on said body for engaging an article forming a part of the load;

pairs of said chain caps being adapted for engaging opposing sides of an article forming a part of the load, so that the articles may be stacked one atop the other and side-by-side to form a stable load with said interfitting surfaces preventing lateral movement between articles stacked one atop the other and tie bar surfaces engaging tie bars to stabilize articles stacked in a side-by-side relationship;

said interfitting surfaces and said conformal surfaces being disposed on opposing sides of said chain cap said interfitting surfaces comprising first, second and third projections extending from one side of said chain cap, said third projection extending between said first and second projections on each chain cap stacked thereatop for stabilizing each of said chain caps in a lateral direction when a plurality of said chain caps are stacked with said interfitting surfaces facing; and

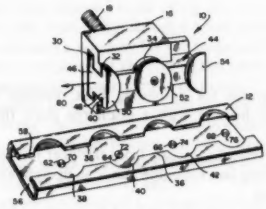
means for receiving a clamping tension band for securing a plurality of said chain caps and a plurality of articles into a stable load suitable for vehicular travel.

4,496,271

RESTRAINING FITTINGS

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,837
Int. Cl.³ B60P *7/08*
U.S. Cl. 410—105 **20 Claims**



1. A restraining fitting suitable for use with a mating track member having a plurality of bore holes provided in a longitudinal undercut channel, comprising:

(A) an upper member having a lower surface, upper surface and a restraining means provided, thereon, said lower surface of said upper member being provided with;

(a) channel means, and

(b) downwardly depending spaced apart protrusions formed to cooperate with and be received by said track member bore holes; and

(B) a lower member having an upper surface formed to be slidably retained by said upper member channel means and cooperate therewith, said lower member being provided with;

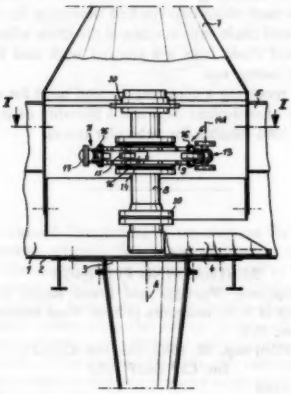
(a) a lower surface having a plurality of downwardly depending spaced apart protrusions positioned to extend beyond and to coincide with said depending protrusions provided on said lower surface of said upper member in a first position and to be displaced therefrom when moved to a second position.

4,496,272

ROTARY ARM-TYPE UNLOADER FOR BULK-STORAGE BIN

Lothar Teske, Hegelstrasse 15, D-5000 Köln 90, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,084
Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216795
Int. Cl.³ B65G 65/00
U.S. Cl. 414—323 8 Claims



1. An apparatus for unloading bulk material from a bin having a floor formed with a discharge port, the apparatus comprising:

a housing vertically spaced from the port in the bin;

a shaft defining and rotatable about an upright axis generally at the port;

at least one arm extending at least generally radially from the shaft and being sweepable through the material and over the port on rotation of the shaft;

a toothed drive wheel centered on the axis and fixed on the shaft;

first and second pairs of actuators each having an outer end pivoted on the housing and an inner end constituted as a pusher engageable tangentially with the teeth of the wheel, the actuators being generally angularly equispaced around the axis and the actuators of the first pair alternating with those of the second pair; and

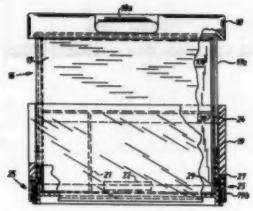
control means for extending the first-pair actuators with their pushers in force-transmitting engagement with the wheel while contracting the second-pair actuators and for alternately contracting the first-pair actuators while extending the second-pair actuators with their pushers in force-transmitting engagement with the wheel, with the contraction stroke of each pair commencing after the start of and terminating before the end of the expansion stroke of the other pair, whereby before each alternation all of the actuators are in force-transmitting engagement with the wheel.

4,496,273

ARRANGEMENT FOR SUPPLYING UNEXPOSED X-RAY FILMS TO A HANDLING APPARATUS

Kurt Thate; Heinrich Färber, and Jürgen Müller, all of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,159
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122582
Int. Cl.³ B65G 65/00
U.S. Cl. 414—411 10 Claims



10. An arrangement for supplying photosensitive sheets, especially X-ray films of a magazine, in an ambient light unexposed manner, comprising:

a receptacle for holding the magazine and being movable between an open and a closed position:

a channel member containing an inlet passage;

a tubular casing member being axially shiftably mounted and surrounding said receptacle in said closed position and during which overlapping only a part of the magazine surface, said tubular casing member having a wide side on which there extends a film discharge opening through which the magazine is displaced to said open position of said receptacle, said tubular casing member forming a light tight seal between inself and the magazine as well as between the magazine and said channel member during said open and closed positions of said receptacle and during the transfer of the magazine from said open to said closed position of said receptacle and vice versa; and

suction means situated after said inlet passage as considered in the direction of introduction of said receptacle into said inlet passage, said receptacle member having a cutout juxtaposed with said suction means when said tubular casing member assumes releasing position in said channel member and said receptacle is in said open position.

4,496,274

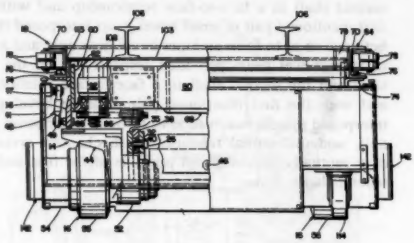
MATERIAL HANDLING VEHICLE

George R. Pipes, Salt Lake City, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 11, 1982, Ser. No. 406,258
Int. Cl.³ B65G 67/00; B60P 1/02; B62D 25/00
U.S. Cl. 414—340 13 Claims

1. A vehicle comprising a first frame, a second frame attached to said first frame for pivotal movement about a first horizontal axis perpendicular to the longitudinal axis of the vehicle, a third frame attached to said first frame for pivotal movement about a second horizontal axis parallel to the longitudinal axis of the vehicle, first and second motor wheel units mounted on said third frame, each of said motor wheel units

including a drive wheel having its rotational axis substantially vertically aligned with said first horizontal axis, and a load



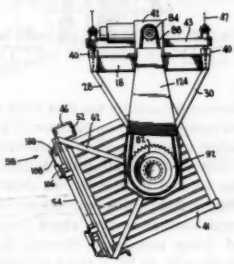
platform suspended from said first and second frames for swinging movement in a plurality of planes.

4,496,275

APPARATUS AND METHOD FOR TIPPING CARGO CONTAINERS

James J. Harp, Annandale, Va., assignor to Resource Ventures, Inc., Alexandria, Va.

Filed May 4, 1982, Ser. No. 374,706
Int. Cl.³ B65G *63/00, 65/34;* **B63B** *27/00;* **B66C** *1/00*
U.S. Cl. 414—420 **34 Claims**



16. Apparatus for delivering bulk material into a designated receiving space from a cargo container of the type including a generally rectangular, frame-like border surrounding an upper edge thereof and a plurality of spaced, lock-receiving openings disposed along the border, said apparatus comprising:

a drive support member;

a pivotal member;

engagement means for engaging said drive support member and said pivotal member for mutual pivotal displacement about a horizontal pivot axis;

a plurality of twist lock members depending from said pivotal member spaced to engage respective lock-receiving openings along the container border for selectively securing said pivotal member to the cargo container in fixed relation; and

selectively actuable drive means secured to said drive support member for selectively pivoting said pivotal member about said pivot axis with respect to said drive support member so as to pivot the container through an angle of at least 90° to dump the bulk material.

27. A tipping adapter for use in connecting a cargo container to a cargo container spreader suspended from a gantry cantilever crane in order to permit selective tipping of the container for the purpose of pouring bulk material therefrom, the cargo container being of the type which has first portions of respective plural latching engagements disposed thereon in spaced relation, the container spreader having second portions of the plural latching engagements disposed thereon in spaced relation so as to permit selective engagment between the spreader and the container, said adapter comprising:

a drive support member having disposed thereon plural first latching engagement portions which are spaced to provide selective engagement with the second latching engagement portions of the container spreader;

a pivotal member having disposed thereon plural second latching engagement portions which are spaced to provide selective engagement with the first latching engagement portions of the cargo container;

means for pivotally engaging said drive support member and said pivotal member for mutual rotation about a pivot axis; and

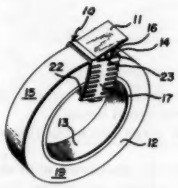
motor means for selectively pivoting said pivotal member relative to said drive support member about said pivot axis.

4,496,276

SHEAR

Lev Shulyak, Worcester, Mass., assignor to Shel Industries, Inc., Boston, Mass.

Filed Sep. 2, 1982, Ser. No. 414,569
Int. Cl.³ B26F *3/02*
U.S. Cl. 225—65 **4 Claims**



1. Shear for tape in a roll having an inner circumferential surface which defines a central opening, comprising:

(a) a main body adapted to lie along the outer periphery of the roll, the main body having a blade extending radially of the roll, and a window for the passage of the tape from the outer periphery of the roll to the blade,

(b) a wing hingedly connected to each side of the main body and adapted to lie along a radial surface of the roll, said wing being provided with laterally-extending springy fingers, each finger having an inwardly-extending peg adjacent its outer end which is adapted to bear against the radial surface of the roll, and

(c) locking means adapted to extend into said central opening for joining the inner ends of the wings together to hold the wings against the roll so that the pegs of the fingers which are aligned with the radial surfaces of the roll bear against said radial surfaces under tension and the pegs of the fingers which are aligned with said central opening are urged into said central opening, so that at least one of the pegs which extends into said central opening bears against said inner circumferential surface for maintaining the outer periphery of the roll against the main body of the shear, whereby the shear is self adjusting to the changing diameter of the roll as it is used.

4,496,277

LIFTING DEVICE AND METHOD

Emil A. Jungman, Escondido, Calif., assignor to Jungman, Inc., Monroe, La.

Filed Apr. 12, 1982, Ser. No. 367,437
Int. Cl.³ B66C *23/32*
U.S. Cl. 414—589 **8 Claims**

1. A lifting device for use on the outside of a structure and designed for lifting elongated objects from a lower elevation outside of the structure to a higher elevation inside the struc-

ture by turning the elongated object when required, comprising:

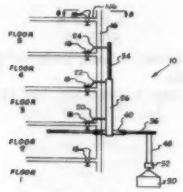
(a) a generally vertical frame;

(b) means for attaching the frame to the structure;

(c) a pair of boom carriages mounted on the frame and designed for a normal operative position horizontally on the frame so that a portion of the boom carriages are located within the structure and a portion of the boom carriages are located outside the structure;

(d) means, associated with the frame and each boom carriage, for horizontally positioning the boom carriages on the frame at pre-determined positions for independent transverse movement along the structure on the frame within pre-determined limits;

(e) a movable boom positioned within each boom carriage



and movable horizontally within the boom carriages within pre-determined limits;

(f) a trolley and cargo block positioned in and carried by each boom;

(g) activating means, associated with the frame, boom carriages, boom trolleys and cargo blocks for raising and lowering the cargo blocks and moving the trolleys and cargo blocks along the booms, the activating means capable of also moving the booms within the boom carriages into and out of the structure, and moving the boom carriages and booms apart or together as desired; the combined action of the activating means serving to allow an elongated object to be picked up by the cargo blocks and to be raised to a desired upper elevation whereupon the object may be turned from a transverse position to a longitudinal position and may then be moved into the structure.

4,496,278

INDUSTRIAL ROBOT EQUIPPED WITH ARTICULATED ARM UNIT

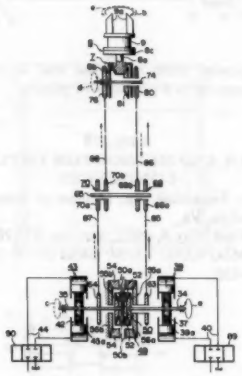
Tatsuo Kaise, Yokosuka, Japan, assignor to Okamura Corporation, Yokohama, Japan

Filed Jun. 21, 1982, Ser. No. 390,372
Claims priority, application Japan, Apr. 7, 1982, 57-56496
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—735 **8 Claims**

1. In an industrial robot equipped with an articulated arm unit including a first arm pivotally attached at its basal end portion to a shoulder shaft, a second arm pivotally coupled at its basal end portion to the free end of the first arm by means of an elbow shaft, a holder case pivotally connected to the free end of the second arm by means of a wrist shaft, and a holder supported by the holder case in such a way that the holder is turnable about an axis, which extends perpendicularly to the wrist shaft, by means of a shaft journalled on the wrist shaft, wherein the improvement comprises:

a first shaft and a second shaft disposed on the same axis and rotatable independently from each other to thereby form the shoulder shaft for the first arm;

a differential transmission mechanism comprising a floating shaft extending perpendicularly to the second shaft and journalled on the second shaft, a pair of small bevel gears journalled on the floating shaft with the floating shaft interposed therebetween, a pair of large bevel gears journalled on the floating shaft respectively at locations adjacent to both free ends of the floating shaft, a pair of small bevel gears provided respectively on the first shaft and the second shaft in a face-to-face relationship and with the first mentioned pair of small bevel gears interposed therebetween so as to form an inner bevel gear unit, and a pair of large bevel gears provided respectively on the first shaft and the second shaft in a face-to-face relationship and with the first mentioned pair of large bevel gears interposed therebetween so as to form an outer bevel gear unit, said differential transmission mechanism arranged over mutually-opposing end portions of the first and the second shafts; and



a first drive means formed by the first shaft and a first coupling means comprising a combination of a pair of sprockets and endless chain extending therebetween and being connected thereto for rotating the holder, and a second drive means formed by the second shaft and a second coupling means comprising a combination of a pair of sprockets and another endless chain extending therebetween, and being connected thereto for rotating the holder case as well as by a third coupling means connected to the differential transmission mechanism so as to compensatively rotate the holder.

4,496,279

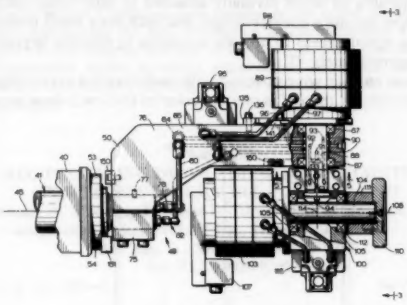
ROBOT ARM AND WRIST ASSEMBLY

William J. Langer, Eden Prairie, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Dec. 9, 1982, Ser. No. 448,217
Int. Cl.³ B25J *17/02*
U.S. Cl. 414—735 **11 Claims**

1. A robot arm and wrist assembly comprising a mounting arm, a coupling member having a base mounted on said mounting arm for rotation about a first axis, and the coupling member having an offset bracket portion offset from the base and extending in direction along and spaced from the first axis to provide an unobstructed space around said first axis when the coupling member is rotated about the first axis, a first actuator mounted on said offset bracket portion of the coupling member, said first actuator having a housing mounted on an opposite side of the offset bracket portion from the first axis and a first rotatable output shaft extending from the housing toward the first axis and rotatable relative to the housing and the coupling member about a second axis perpendicular to the first axis, said first and second axes intersecting, and a second actuator drivably mounted on the rotatable output shaft of the first actuator within the unobstructed space defined by the offset bracket portion, said second actuator having a second output shaft rotatable about a third axis which generates a plane in

which the first axis lies when the second actuator is rotated with the first output shaft about the second axis, in at least one rotational position of the second actuator about the second axis



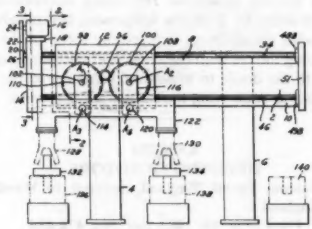
the first and third axes coinciding, the unobstructed space around the first axis permitting the second actuator to be rotated to position between the base of the coupling member and the second axis with the first output shaft.

4,496,280

WORKPIECE TRANSFER MECHANISM

John H. Brems, 2800 S. Ocean Blvd., Apt. 16-D, Boca Raton, Fla. 33432

Filed Dec. 22, 1982, Ser. No. 452,327
Int. Cl.³ B65G *47/34*
U.S. Cl. 414—749 **10 Claims**



1. In a transfer system in which one or more workpieces are sequentially moved along a line of fixtures, pallets or other workpiece holding devices, with each move along a continuous predetermined path, comprising a first relatively short motion in a first direction such as lifting, a second relatively long motion generally at right angles to the first motion such as a horizontal transfer, and a third motion generally parallel to and in the opposite direction to the first motion such as lowering, a mechanically interrelated system comprising:

(a) a structural frame,

(b) carriage means mounted on said structural flame for movement along a substantially linear first path,

(c) linear drive means mounted to said carriage means for movement in a substantially linear path parallel to said first path,

(d) transfer means mounted on said carriage means for movement in a circular path of translation with respect to said carriage means,

(e) cam means interconnecting said linear drive means and said carriage means, and

(f) interrelated drive means for driving said linear drive means along said structural frame at a first rate, and simultaneously driving said transfer means in a circular path of translation with respect to said carriage means at a rate proportional to said first rate, and simultaneously driving said cam means,

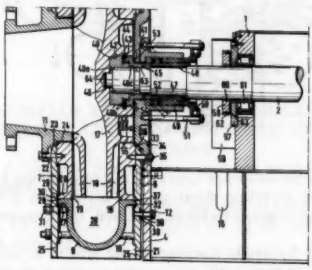
whereby said transfer means move in a general path characterized as the superposition of a linear motion on a proportional circular motion, and whereby said transfer means move in a specific predetermined path created by the additional superposition on said general path of a modifying motion generated by said cam means between said carriage means and said linear drive means.

4,496,281

CENTRIFUGAL PUMP

Horst-Günter Noack, Witten-Annen, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Continuation of Ser. No. 185,875, Sep. 9, 1980, , which is a continuation of Ser. No. 901,629, May 1, 1978,. This application Aug. 25, 1983, Ser. No. 526,447
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719168
Int. Cl.³ F03B *11/02*
U.S. Cl. 415—111 **2 Claims**



1. A centrifugal pump for the conveyance of abrasive media under large pressure, comprising:

an axial inlet pipe;

an impeller arranged in overhung fashion on an impeller shaft;

a stuffing box housing surrounding the shaft;

a pump housing connecting to the inlet pipe and stuffing box housing, said pump housing comprising two similarly constructed wall parts, one wall part extending from the inlet pipe outwardly and the other wall part extending from the stuffing box housing outwardly, a spiral housing of annular shape and a laterally projecting ring on each side thereof, said spiral housing being in contact with outer portions of the wall parts to create an enclosed area within which the impeller is housed, and two planar holding discs constructed of rolled material between which the two wall parts and spiral housing are mounted, one of said holding discs extending from the inlet pipe outwardly and the other holding disc extending from the stuffing box housing outwardly, connecting bolts positioned external to the spiral housing pulling the two holding discs toward each other so as to provide direct contact with the laterally projecting ring on the spiral housing;

a holding plate connecting to one of the holding discs to support the pump housing;

a rib projecting radially outwardly from and beyond the spiral housing between the holding discs in a direction perpendicularly thereto and directly adjacent each of the connecting bolts, each rib having an outer processing in the form of a projecting abutment portion abutting in a corresponding recess in an outer rim completely outwardly of the connecting bolts of each of the holding discs so as to provide an outer support of the holding discs outwardly of the connecting bolts and so as to strengthen

the pump housing to permit handling large pressure heads; whereby

the rib projecting abutment portions and spiral housing ring cooperate with the holding discs and connecting bolts to provide a centrifugal pump having a spiral housing formed of low cost material and able to withstand large pressure heads.

4,496,282

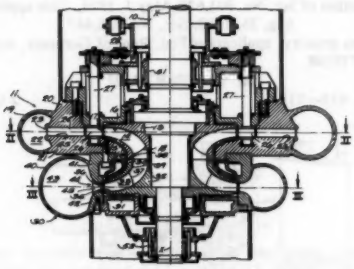
REVERSIBLE TWO-STAGE HYDRAULIC MACHINE

Alexander Gokhman, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 6, 1982, Ser. No. 375,701

Int. Cl.³ F01D *13/02*

U.S. Cl. 415—161 **11 Claims**



1. A reversible two-stage hydraulic machine having a rotary shaft operable to rotate about an axis of rotation in both a clockwise and counterclockwise direction, the improvements comprising:

a first-stage hydraulic machine runner affixed to said shaft for rotation therewith; said runner having a plurality of runner blades cooperating to define a plurality of fluid passages through said runner; each of said passages having a radial opening which opens along a plane perpendicular to said shaft and an axial opening parallel to said shaft;

a second-stage hydraulic machine runner affixed to said shaft for rotation therewith; said runner having a plurality of runner blades cooperating to define a plurality of fluid passages through said runner; each of said passages having a radial opening which opens along a plane perpendicular to said shaft and an axial opening parallel to said shaft; said axial openings of said second-stage runner facing said axial openings of said first-stage runner in fluid flow communication;

means for connecting said radial openings of said first-stage runner in fluid flow communication with an upper water reservoir; and,

means for connecting said radial openings of said second-stage runner in fluid flow communication with a lower water reservoir at an elevation below said upper reservoir.

4,496,283

WIND TURBINE

Andrej A. Kodric, 340 Dixon Rd., Apt. #1808, Weston, Ontario, Canada M9R 1T1

Continuation-in-part of Ser. No. 470,915, Mar. 1, 1983, abandoned. This application Mar. 26, 1984, Ser. No. 594,462

Int. Cl.³ F03D *7/06*

U.S. Cl. 416—44 **17 Claims**

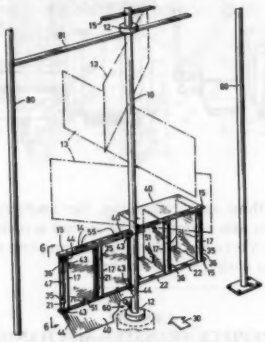
1. A wind turbine comprising:

a vertical shaft being rotatable about its longitudinal axis;

a plurality of vanes attached to the shaft for capturing the force of the wind thereby imparting rotation to the shaft, each vane comprising two wings disposed planarly opposite one another about the shaft, each wing having at least an upper and a lower substantially horizontal arm, each vane being situated along the height of the shaft at a separate level so as not to overlap any other vane, and adjacent vanes being disposed along the shaft at the same dihedral angle to one another in a staggered fashion;

a plurality of doors pivotally attached to each wing, each door having a counterweight, and each door being biased by spring means to provide resistance to opening beyond approximately 45°;

means on each wing coacting with each door for preventing movement thereof in one direction so that each door may



pivot between a closed and an open position in response to the force of the wind; and

a pair of auxiliary panels pivotally attached to each wing, one panel being attached to the upper arm and the other panel being attached to the lower arm of each wing, the panels having means for restricting movement thereof beyond about 45° from the horizontal, said panels cooperating with the doors to capture the force of the wind as each wing moves with the wind, and said panels cooperating with the doors to minimize resistance to the force of the wind as each wing moves against the wind.

4,496,284

HELICOPTER ROTORS

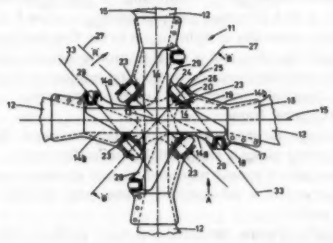
Kenneth Watson, Yeovil, England, assignor to Westland plc, Yeovil, England

Filed Mar. 18, 1983, Ser. No. 476,484

Claims priority, application United Kingdom, Mar. 18, 1982, 8207962

Int. Cl.³ B64C *27/38*

U.S. Cl. 416—138 **8 Claims**



1. A helicopter rotor including, rotor drive means, pitch control means, at least one pair of diametrically opposed rotor blades arranged for rotation about an axis, a generally flattened strap member interconnecting opposed blade pairs with its major dimension coincident with the plane of rotation and extending between leading and trailing edges, the strap mem-

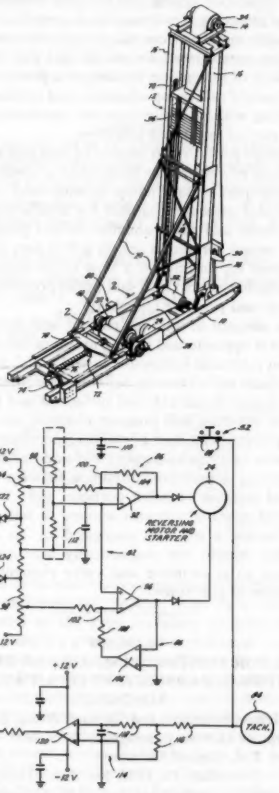
ber being flexible in torsion and in a plane perpendicular to the plane of rotation, lever means attached to each rotor blade and including first connection means pivotally attached to said rotor drive means externally of the strap member and adjacent one of its edges so that the pivotal attachments of opposed blades are on a common axis parallel to the plane of rotation and intersecting the axis of rotation at approximately 45 degrees to the longitudinal axis of the strap member, and second connection means pivotally attached to said pitch control means externally of the strap member and adjacent the other of its edges.

4,496,285

RECIPROCATING DRIVE AND VELOCITY CONTROL FOR LONG STROKE WELL PUMPING UNIT

James W. Albert, and Weems D. Turner, both of Houston, Tex., assignors to Baker ProLift, Inc., Houston, Tex.

Filed Aug. 30, 1983, Ser. No. 527,738
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—12 **14 Claims**



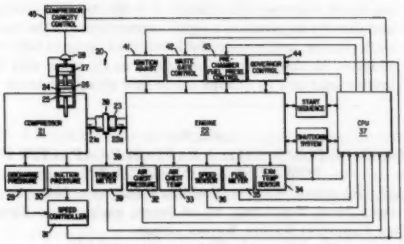
1. A long stroke, well pumping unit comprising: a base platform; a tower on the base platform; drive train means including a rotatable, winding drum means on the base platform and power means to rotate the drum means; a flexible element attached at one end to the drum means and at its other end to the polish rod of a pump; freely rotatable means mounted atop the tower, the flexible element being trained over the rotatable means; a counterweight attached to the flexible element on the opposite side of the rotatable means from the polish rod; means for reversing the power means thus to cyclically wind and unwind the flexible element from the winding drum means and thereby to impart reciprocating movement to the polish rod of the pump, said reversing means including means for de-energizing the power means as the polish rod approaches a desired length of upstroke whereby the polish rod decelerates, reverses direction and accelerates again in the reverse direction or downstroke under the force of gravity; and velocity control means for re-energizing the power means when the polish rod reaches a predetermined velocity in the downstroke, said velocity control means including means for monitoring the velocity of the polish rod, and comparator means responsive to the monitoring means and comparing the velocity of the polish rod with a predetermined reference level, to re-energize the power means when the velocity of the polish rod reaches the pre-determined reference level.

4,496,286

CONTROL SYSTEM FOR ENGINE-DRIVEN COMPRESSOR UNIT AND METHOD OF OPERATION THEREOF

James J. Gagnon, Spring, Tex., assignor to J-W Operating Company, Dallas, Tex.

Filed Jul. 18, 1983, Ser. No. 514,411
Int. Cl.³ F02B *37/12*; F02D *19/00, 23/02*; F04B *35/00*
U.S. Cl. 417—22 **8 Claims**



3. An engine-driven compressor unit comprising:
a gaseous fueled engine having:
a prechamber for each combustion cylinder of said engine in which the ignition is initiated;
a prechamber fuel pressure regulator for controlling gaseous fuel flow to the prechamber;
an air chest for storing air under pressure for mixing with the fuel for said engine;
a turbocharger driven by the exhaust from the engine to supply said air under pressure to said air chest;
a waste gate for controlling the amount of exhaust to drive said turbocharger;
ignition timing means; and
a drive shaft;
a compressor having a driven shaft;
a flexible coupling connecting said drive shaft and said driven shaft together; and
means for continuously measuring the torque developed in said flexible coupling during operation and for generating a signal representative of said measured torque.

4,496,287

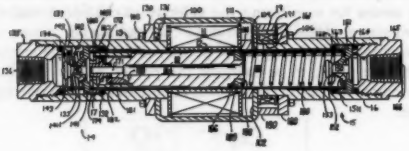
SENSORS FOR DETECTION OF FLUID CONDITION, AND CONTROL SYSTEMS UTILIZING THEIR SIGNALS

Robert M. Nelson, Willow Springs Village, Rte. 1, Box 215, Rosamond, Calif. 93560, and Robert E. Nelson, Rosamond, Calif., assignors to Robert M. Nelson, Rosamond, Calif.

Division of Ser. No. 121,463, Feb. 14, 1980,. This application Jun. 11, 1982, Ser. No. 387,417

Int. Cl.³ F04B *21/00*; G01N *7/00*

U.S. Cl. 417—63 **8 Claims**



1. A sensor for responding to the opposition of a fluid to its own physical displacement, said sensor comprising:

a body having a cavity therein, a flow conduit means enabling entry and exit of fluid to and from said cavity;

a fluid displacement member comprising a plunger having an axis of movement movable in order to vary the volume within said cavity which is available to be occupied by said fluid;

force means adapted to give repetitively a known single impetus to said fluid displacement member for the purpose of ballistically moving it repetitively, each time from a known datum point, repetitively to change said volume; and

sensing means responsive to the motion developed by said member in response to said impetus, as such motion may vary with the varying opposition of said fluid to its own physical displacement by said member, to produce a signal respective to such opposition, said sensing means comprising a coil responsive to change of magnetic flux linking it and thereby to generate a signal proportional to the rate of such change, and magnetizable material integral with said plunger, so disposed and arranged as to cause said flux linking said coil to change when said plunger moves.

4,496,288

VANE TYPE PUMP WITH A VARIABLE CAPACITY FOR POWER STEERING DEVICES

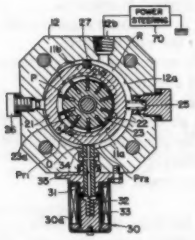
Keiichi Nakamura, Kariya; Yoshiharu Inaguma, Nagoya, and Yutaka Mori, Toyokawa, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 22, 1982, Ser. No. 452,136

Claims priority, application Japan, Dec. 22, 1981, 56-207745

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—213 **8 Claims**



1. A vane type pump with a variable capacity for a power steering device, comprising:

a pump housing having an inlet port and an outlet port and defining a closed chamber therein, a part of said closed chamber being defined by a pair of flat end surfaces extending in parallel relation;

a movable member received in said closed chamber and guided by said pair of said flat end surfaces for movement in said closed chamber, said movable member having a cylindrical bore for dividing said closed chamber into a pressure chamber partly defined by an external surface of said movable member and a pump chamber partly defined by an internal surface of said cylindrical bore;

a drive shaft supported in said pump housing for rotation about an axis parallel to the axis of said cylindrical bore and having one end thereof extending into said pump chamber;

a rotor received in said pump chamber and connected with said one end of said drive shaft for integral rotation therewith, said rotor being formed with a plurality of radial slots at its circumferential surface;

a plurality of vanes respectively received in said plurality of radial slots and movable radially of said rotor and along said internal surface of said cylindrical bore;

urging means for urging said movable member to move in a radial direction of said rotor so as to deflect the axis of said movable member from the axis of said rotor;

a suction port formed on one of said pair of said flat end surfaces of said pump housing at a position opening to a first part of said pump chamber, said suction port communicating with said inlet port for conducting fluid to said first part of said pump chamber;

a discharge port formed on one of said pair of said flat end surfaces of said pump housing at a position opening to another part of said pump chamber and communicating with said pressure chamber for discharging pressurized fluid from said pump chamber to said pressure chamber;

sealing means forming a seal in a first part of said pressure chamber for cutting off a flow of pressurized fluid from said discharge port into said outlet port through said first part of said pressure chamber;

a valve element at another part of said pressure chamber which is opposite said sealing means in the radial direction of said rotor and is movable in said radial direction of said rotor, said valve element defining a throttle in cooperation with a part of said external surface of said movable member for dividing said pressure chamber into first and second pressure chamber portions respectively communicating with said discharge port and said outlet port, thereby generating a pressure difference between said first and second pressure chamber portions; and

a solenoid operated actuator secured to said pump housing and having a solenoid energized by an electric signal applied thereto for magnetically attracting said valve element so as to move said valve element in said radial direction of said rotor.

4,496,289

DEVICE FOR CONTROLLING AND/OR MEASURING OPERATIONAL PARAMETERS OF AN AXIAL PISTON MACHINE

Joachim Heiser, Stuttgart, and Gerhard Wilke, Korntal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,265

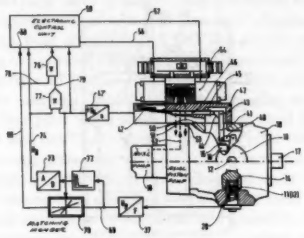
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1982, 3208250

Int. Cl.³ F04B *1/26*

U.S. Cl. 417—217 **13 Claims**

1. A device for controlling and/or measuring operational parameters of an adjustable axial piston machine including axial pistons, a tilting plate cooperating with the pistons and being supported for angular displacement on two opposite pivot points, and means for adjusting the angular position of the tilting plate, said device comprising a data processing unit for producing control signals, means controlling said adjusting

means in response to said control signals, at least one of said pivot pins being provided with a strain sensor which converts forces acting upon the pin into data indicative of delivery pressure and rotary speed of the machine; means for separating and feeding the data into said data processing means; said one



pivot pin having a tubular configuration and being made of a soft magnetic material, said sensor being located in said one pivot pin and including a pick-up transformer operating on magnetoelastic principle and having an open magnetic circuit cooperating with the material of said one pin.

4,496,290

CONTROL DEVICE FOR MAINTAINING THE PRODUCT OF THE LIFTING PRESSURE AND LIFTING VOLUME TIMES FLOW CONSTANT IN AN ADJUSTABLE PUMP

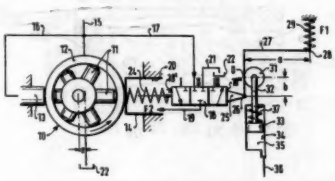
Gerhard Nonnenmacher, Korntal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,960

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200867; Mar. 5, 1982, 3207961

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—220 **15 Claims**



1. A control device for maintaining the product of the pumping pressure and pumping volume times flow constant in a pumping system of the type including an adjustable pump furnishing a pumping pressure and a pumping volume at an output side and having a regulating element for adjusting said volume, and a first and second pressure-controlled pistons for adjusting the regulating element, the control device comprising control valve means adapted to control the pressure on said second piston; an adjusting lever operatively connected to said control valve means; means for producing a first force acting on said adjusting lever and including a first spring with approximately linear characteristic, said first spring acting upon said second piston and being operatively connected to said valve control means, said first spring having a prestressing corresponding to a linear proportional path of the pumping volume of the pump; means for producing a second force acting on said adjusting lever, said adjusting lever having at least one arm operatively connected to said valve control means; and means for varying the length of said arm proportionally in accordance with a working pressure of the pump and including a cylinder and a piston slidably positioned therein, said piston in said cylinder being loaded by a pumping pressure of the pump and being connected to said arm and being adapted to vary the length of said arm in accordance with the pressure in said cylinder, whereby in the case of unbalance between said first force and said second force said control valve means is actuated by said arm so as to control the regulating member of the pump via said second piston until the pumping volume of the pump is corrected and a balance between said first force and said second force is reached to maintain said valve control means in equilibrium position.

4,496,291

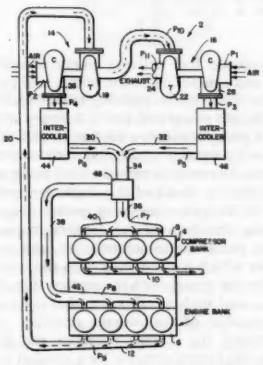
COMPOUND TURBOCHARGER SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

John E. Grimmer, Franklin, Ind. 46131

Filed Nov. 13, 1981, Ser. No. 321,089

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—247 **10 Claims**



1. A method for forming a turbocharged engine/compressor unit from a conventional multi-cylinder internal combustion engine having plural pistons mounted, respectively, for reciprocatory motion within the cylinders and a single crankshaft for interconnecting the pistons, comprising the steps of

(a) converting at least one engine cylinder to operate as an air compressor cylinder by isolating the cylinder from the engine fuel supply and by supplying air to the compressor cylinder during the corresponding piston downstroke and by exhausting air during the corresponding piston upstroke and further by diverting the compressed air through a compressed air outlet which is isolated from the engine exhaust system;

(b) providing a pair of turbocharger units each of which includes a compressor and a mechanically connected, exhaust driven turbine for supplying air to both said engine cylinder and to said compressor cylinder to increase engine cylinder output torque and to increase the volume of compressed air supplied to the air outlet by the compressor cylinder, said step of providing turbocharger units for supplying air including the substeps of:

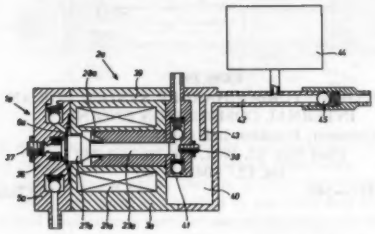
(1) providing means for connecting the exhaust turbines fluidically in series to receive exhaust gases in series solely from the engine cylinder, and

(2) providing means for connecting the compressors fluidically in parallel for receiving air from the atmosphere and for providing air under pressure in parallel to both the engine and compressor cylinders.

4,496,292
ELECTROMAGNETIC FUEL DELIVERY AND METERING PUMP

Karl Panick, Planegg, and Joseph Glass, Ottobrunn, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Division of Ser. No. 58,622, Jul. 18, 1979, Pat. No. 4,309,153.
This application Dec. 7, 1981, Ser. No. 328,225
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2831437
Int. Cl.³ F04B *3/00, 17/04*
U.S. Cl. 417—252 **6 Claims**



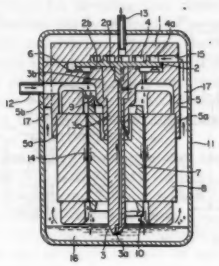
1. Electromagnetic fuel delivery pump comprising a diaphragm pump and a metering piston pump, said pumps having working chambers and means enabling interconnection thereof when the diaphragm pump executes a delivery stroke and the metering piston pump executes a suction stroke, said metering piston pump having a piston connected with an armature of an electromagnet, and a common return spring being provided for executing the delivery stroke of the diaphragm pump and the suction stroke of the piston metering pump, characterized in that the working chambers of the diaphragm pump and the metering piston pump are interconnected, and comprising a storage chamber which is connected with the working chamber of the diaphragm pump, with the suction side of the metering piston pump and with a reflux line that carries off fuel in excess of the capacity of said storage chamber, wherein the connection between the storage chamber and the working chamber of the diaphragm pump is by a conduit opening into a top portion of the storage chamber, wherein the connection between the suction side of the metering piston pump and the storage chamber is at a bottom portion thereof, wherein the connection between the reflux line and the storage chamber is at a top portion thereof.

4,496,293
COMPRESSOR OF THE SCROLL TYPE

Toshiyuki Nakamura; Tsutomu Inaba, and Tadashi Kimura, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,551
Claims priority, application Japan, Dec. 28, 1981, 56-215823
Int. Cl.³ F04B *39/06;* F04C *18/02, 29/04;* H02K *9/00*
U.S. Cl. 417—371 **8 Claims**

1. A compressor of the scroll type comprising a compression part including a stationary and a movable scroll each having a convolute shape and contacting one another so as to form compressing chambers, including a suction portion, therebetween; a motor to drive said movable scroll; a shell containing said compression part and said motor and having an oil sump at the bottom thereof; a frame separating the inside of said shell into said compression part and a motor chamber containing said motor, said frame being provided therein with an upper portion of said motor chamber and means, including an inlet passage respectively communicating at opposite ends with the exterior of said compressor and with said upper portion of said motor chamber, delivering a suction gas through said inlet passage into said upper portion of said motor chamber; and means for guiding the suction as from said upper portion of said motor chamber downward into said oil sump and then upward from said oil sump to said suction portion of said compression part; said delivering means and said suction gas guiding means including means for preventing the suction gas

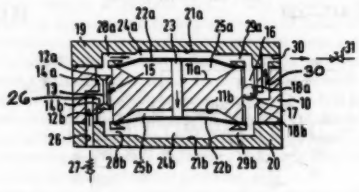


passing through said inlet passage from flowing into said oil sump before being delivered to said upper portion of said motor chamber and from passing into said suction portion of said compression part before passing into said oil sump.

4,496,294
DIAPHRAGM PUMP

Jozsef Frikker, Dreieich, Fed. Rep. of Germany, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Dec. 21, 1982, Ser. No. 451,981
Claims priority, application United Kingdom, Dec. 22, 1981, 8138785
Int. Cl.³ F04B *43/06;* F01L *25/02*
U.S. Cl. 417—393 **9 Claims**



1. An improved diaphragm pump comprising:

a housing having a material inlet port and a material discharge port, said housing defining a first chamber and second chamber; a first diaphragm means fixed within said first chamber to define a first fluid chamber and a first material chamber, said material chamber being in communication with said material inlet port and said material discharge port and a second diaphragm means fixed within said second chamber to define a second fluid chamber and a second material chamber, said second material chamber being in communication with said material inlet port and said material discharge port, said first diaphragm means and said second diaphragm means operatively interconnected to alternate between a forward stroke in which working fluid supplied under pressure from a working fluid source is admitted to said first fluid chamber to pump material contained in said first material chamber through said material discharge port and working fluid is discharged from said second fluid chamber to draw material to be pumped through said material inlet port into said second material chamber and a return stroke in which the working fluid is supplied under pressure to said second fluid chamber to pump material contained in said second material chamber through said material discharge port

and working fluid is discharged from said first fluid chamber to draw material through said material inlet port into said first material chamber; a first pilot valve in said housing positioned between and in communication with said first fluid chamber and said second fluid chamber and a second pilot valve in said housing positioned between and in communication with said first fluid chamber and said second fluid chamber, said first and second pilot valves being in a normally closed state and positioned for engagement by said first and second diaphragm means respectively, said first diaphragm means engaging and actuating said first pilot valve when the working fluid is exhausted from said first fluid chamber, said first pilot valve opening upon engagement by said first diaphragm and directing a portion of the working fluid contained under pressure in said second fluid chamber into said first fluid chamber to initiate expansion of said first fluid chamber, said second diaphragm means engaging and actuating said second pilot valve when the working fluid is exhausted from said second fluid chamber, said second pilot valve opening upon engagement by said second diaphragm and directing a portion of such working fluid contained under pressure in said first fluid chamber into said second fluid chamber to initiate expansion of said second fluid chamber; and a control valve means for reversing the stroke of said pump, said control valve means being adapted to receive and exhaust the working fluid under pressure.

4,496,295

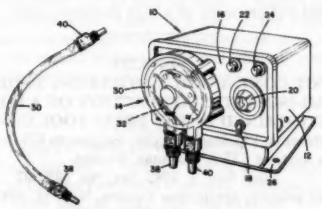
PERISTALTIC PUMPS

Oswald M. King, 3321 Devon Cir., Huntington Harbor, Calif. 92649

Continuation-in-part of Ser. No. 360,406, Mar. 22, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,430

Int. Cl.³ F04B *43/12*

U.S. Cl. 417—477 **10 Claims**



1. For use in a peristaltic pump of the kind in which a length of tubing is disposed in a housing, the housing having an end wall and having an inner wall whose shape defines a segment of a circle, and a set of rollers rotatable about an axis which extends through the end wall, said rollers serving to compress said tubing against said side wall at successive points along said side wall, and the housing being formed with locking elements for engaging key structures at the ends of the tubing and preventing relative rotation of the tubing ends about the central axis of the tubing from a given angular orientation of said key structures:

a length of resilient peristaltic pump tubing each end of which is fitted with a respectively associated key structure fixed to the tubing such that when the tubing is relaxed the two key structures have a relative angular orientation about the center line of the tubing which differs from said given angular orientation by a substantial amount not more than one-half turn about said central axis.

4,496,296

DEVICE FOR PRESSING ORBITING SCROLL MEMBER IN SCROLL TYPE FLUID MACHINE

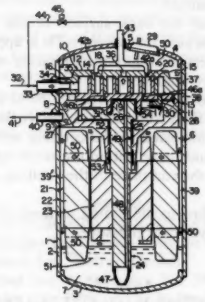
Nobukatsu Arai; Shigeru Machida; Eiji Sato, all of Ibaraki; Kenji Tojo, and Naoshi Uchikawa, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1983, Ser. No. 456,486

Claims priority, application Japan, Jan. 13, 1982, 57-2699

Int. Cl.³ F01C *1/02, 19/00*; F04B *49/02*

U.S. Cl. 418—55 **26 Claims**



1. A scroll type fluid machine comprising:

a stationary scroll member having an end plate and a spiral wrap formed on one side of said stationary scroll member so as to protrude upright therefrom;

an orbiting scroll member having an end plate and a spiral wrap formed on one side of said end plate so as to protrude upright therefrom, and adapted to be coupled with said stationary scroll member such that said wraps on both scroll members mate with each other to define a plurality of working chambers therebetween;

a frame means fixed to said stationary scroll member;

a driving means for causing an orbiting movement of said orbiting scroll member, said driving means including a main shaft rotatably carried by said frame means through bearings, an eccentric shaft adapted to transmit the movement of said main shaft to said orbiting scroll member at a position spaced by a distance substantially equal to a radius of relative orbiting movement between said scroll members;

a high pressure port means;

a low pressure port means;

a rotation prevention means disposed between said orbiting scroll member and a stationary part of said machine so as to maintain a fixed angular relationship of said orbiting scroll member to said stationary scroll member;

a first back pressure chamber defined by a cooperation of said frame means, said drive shaft and said orbiting scroll member, said first back pressure chamber being adapted to hold a fluid pressure which imparts an axial pressing force to said orbiting scroll member;

a first back pressure passage means providing a communication between said first back pressure chamber and at least one of said working chambers which holds an intermediate pressure of the fluid and does not substantially communicate with said low pressure port means and never communicates with said high pressure port means;

a second back pressure chamber defined by said eccentric shaft of said driving means and by a shaft supporting portion rotatably and axially movably engaging with said eccentric shaft, said second back pressure chamber being adapted to hold a fluid pressure for imparting an axial pressing force to said orbiting scroll member;

a second back pressure passage means including a fluid passage formed in said driving means and adapted to introduce the fluid pressure into said second back pressure

chamber so as to impart an axial pressing force to said orbiting scroll member; and

wherein the first back pressure chamber and the second back pressure chamber have a volume such that a total axial pressing force applied therefrom to the orbiting scroll member is in accordance with the following relationship:

$$Pb \cdot Ab + Pd \cdot Ad = Fpa + (Ms/Rb) + Fs$$

where:

Pb=a suitable intermediate pressure in the first back pressure chamber,

Ab=an area of the back surface of the orbiting scroll member to which the pressure Pb is applied,

Pd=a high pressure of gas or lubricating oil in the second back pressure chamber,

Ad=an area to which the pressure Pd is applied,

Fpa=an axial fluid force within the working chambers,

Ms=moment imparted to the orbiting scroll member by the radial fluid force within the working chambers,

Rb=radius of the end plate of the orbiting scroll member, and

Fs=force applied to the sliding surfaces of the end plates caused by hydraulic pressure.

4,496,297

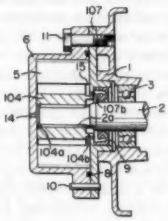
ROTARY VANE PUMP WITH OVERLAPPING ROTOR AND HOUSING PORTIONS

Hitoshi Ogawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 269,661, Jun. 2, 1981, abandoned. This application Nov. 28, 1983, Ser. No. 555,415

Int. Cl.³ F04C *2/00, 15/00*

U.S. Cl. 418—133 **3 Claims**



1. A pump means comprising: a housing means having a cylindrical inner peripheral surface and provided with an inlet port and an outlet port, an integral end wall with an inner surface closing one end and the other end being open; a disc means secured to said open end of said housing means to constitute a working chamber together therewith and having a central opening eccentric to the center of said cylindrical inner surface of said housing means, a rotor means rotatively contained within said working chamber and abutting only in sliding relationship against said end wall and said disc means for permitting radial sliding movement relative thereto and having a splined axial bore therethrough adapted to slide onto a splined shaft introduced into said working chamber through said central opening of said disc means, a plurality of radial vanes each shiftably received within a corresponding slot in said rotor means and adapted to have its outer end surface always shiftably abut against said cylindrical inner surface of said housing means, and means for limiting radial sliding movement of said rotor within said working chamber when said rotor is not secured on a shaft and consisting of an overlapping portion on at least one of said disc means and said rotor means and extending axially thereof into axial overlapping relation with the other of said disc means and said rotor means and having a peripheral surface spaced radially a slight distance from the other of said disc means and said rotor means.

4,496,298

DIE PLATE FOR GRANULATION PRESSING, PARTICULARLY FOR THE MANUFACTURE OF FEED GRANULES

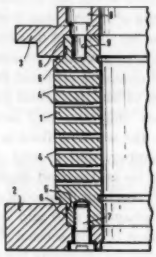
Peter Münch, In der Beek 126 b, 5600 Wuppertal 1, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 395,901

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127506

Int. Cl.³ B29F *3/012*

U.S. Cl. 425—192 R **11 Claims**



1. Die for granulation presses, particularly for the manufacture of feed granulates, comprising:

a one-piece cylindrical, cross-sectionally circular center element consisting of wear-resistant steel having a plurality of granulating openings,

a drive flange arranged on one axial end of the center element for connecting the center element to a drive element of the granulation press; and

a connecting flange arranged on the other axial end of the center element, said connecting flange having a greater outside diameter and radial strength than said drive flange;

means for rigidly fixing said drive flange and said connecting flange to said center element;

wherein the connecting flange and drive flange are formed and used as mounting flanges for holding the center element and are made of a high durability steel.

4,496,299

UNIT CONTAINING A MOULDING TOOL FOR SEMI-ISOSTATIC COMPACTION OF A POWDER CONTAINED IN THE PRESS TOOL CAVITY

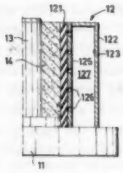
Ola Pettersson, Vipvägen, Sweden, assignor to KB Cold Isostatic Press Systems CIPS, Hoganas, Sweden

Filed Nov. 2, 1983, Ser. No. 548,002

Claims priority, application Sweden, Nov. 18, 1982, 8206586

Int. Cl.³ B30B *5/02*

U.S. Cl. 425—405 H **7 Claims**



1. A molding system for semi-isostatic compaction of powder, said system including a hydraulic press and a mold unit positionable in a chamber of said press, said mold unit comprising:

an elastomeric jacket defining a cavity for containing the powder;

a sleeve sealingly joined to said elastomeric jacket, said sleeve and said elastomeric jacket defining a cavity; and

a pressure transferring medium in said cavity for transmitting pressure acting upon said sleeve to said elastomeric jacket.

4,496,300

DISC RECORD PRESS FORMING

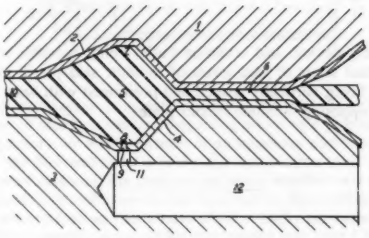
Hermann Strausfeld, Cologne, Fed. Rep. of Germany, assignor to Emi Electrola Gesellschaft mit beschrankter Haftung, Cologne, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,885

Claims priority, application United Kingdom, Apr. 21, 1982, 8211533

Int. Cl.³ B29D *17/00*

U.S. Cl. 425—408 **5 Claims**



1. A record press, for the press forming of disc records, including a pair of jaws and a press tool, said press tool comprising a pair of backing plates with stamper plates affixed thereto, said press tool being mounted between said pair of jaws such that, when said press is closed, said stamper plates face one another to form a disc record shaped cavity and, in use, said record press acts on a shot of plastics material to form a disc record surrounded by flash, said press tool having a number of apertures facing said cavity and vented to atmosphere such that, in use, air present in the vicinity of said apertures is permitted to escape therethrough, wherein said cavity is shaped such that an annular ridge of plastics material encircles the information region of a disc record formed by said press tool, and said apertures are positioned in an annular recess adjacent to said annular ridge such that air present in said annular ridge may escape therethrough.

4,496,301

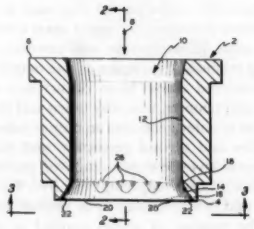
PLASTIC MOLDING APPARATUS

Larry P. Mozer, and Bill T. Morgan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1982, Ser. No. 413,030

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—532 **13 Claims**



1. A die ring having a first end, a second end, a longitudinal axis, and a borehole extending along the longitudinal axis from the first end to the second end, said borehole defining an interior surface of the die ring characterized by a generally frustoconical portion having a first end and a second end and converging from the first end to the second end, the first end of the frustoconical portion being connected to the first end of the die ring and being characterized by a generally opposed pair of one or more first depressions which extend from the first end of the generally frustoconical portion of the borehole toward the second end of the generally frustoconical portion of the borehole, the second end of the generally frustoconical portion of the borehole being characterized by a generally opposed pair of one or more second depressions which extend toward the first end of the generally frustoconical portion of the borehole from the second end of the generally frustoconical portion of the borehole, the generally opposed pair of second depressions being positioned about normally from the generally opposed pair of first depressions, as measured from the centers of each of the pair of first depressions and the pair of second depressions, with respect to the longitudinal axis of the die ring.

4,496,302

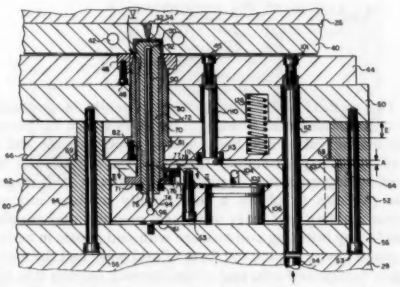
APPARATUS FOR MOLDING PLASTIC ARTICLES

Paul Brown, Orangeville, Canada, assignor to Husky Injection Molding Systems Inc., Bolton, Canada

Filed Jun. 4, 1982, Ser. No. 385,064

Int. Cl.³ B29D *1/00;* **B29F** *1/14*

U.S. Cl. 425—547 **7 Claims**



1. An apparatus for integrally molding a plastic article having a hollow body and an adjoining skirt provided with a plurality of internal projections inclined in a transverse plane at similar acute angles to an inner periphery of the skirt, comprising:

a mold with a male and a female portion relatively displaceable between a mold-closed and a mold-open position, said portions defining in said mold-closed position a cavity connected to a supply of flowable plastic material hardenable into an elastic solid, said cavity including an annular gap centered on an axis and bounded by a sleeve forming part of said male portion and by a surrounding shell forming part of said female portion, said male portion further including a core coaxial with said sleeve, said cavity further having extensions formed by undercut recesses in an outer periphery of said sleeve open toward said gap and inclined at substantially identical acute angles to said outer periphery;

drive means coupled with said male and female portions for alternately establishing said mold-open and mold-closed positions, with full exposure of a molded article adhering to said male portion in said mold-open position while a skirt of a molded article embraces said sleeve with internal projections respectively molded in said recesses; and

ejection means synchronized with said drive means for rotating said sleeve relatively to said core in the direction of divergence of said recesses from said outer periphery to extract molded projections from said recesses and to de-

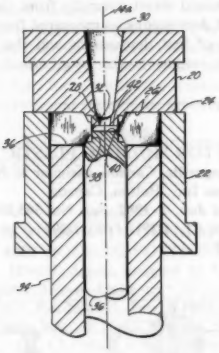
flect molded projections so extracted toward the inner periphery of a skirt embracing said sleeve with resultant elastic radial expansion of such a skirt, said ejection means including a stripper operable to exert upon the expanded skirt an axial thrust removing the molded article from said male portion.

4,496,303

METHOD OF FABRICATING A PERMANENT MAGNET

Robert J. Loubier, Fort Wayne, Ind., assignor to Xolox Corporation, Fort Wayne, Ind.

Filed May 27, 1982, Ser. No. 382,391
Int. Cl.³ B29F *1/03*
U.S. Cl. 425—569 **6 Claims**



1. The method of fabricating a permanently magnetizable body of plastic material filled with particles which are permanently magnetizable, said body having opposite ends and an axis of symmetry extending therebetween, comprising the steps of mixing quantities of plastic material and solid magnetizable particles to obtain a substantially uniform mixture, injection molding said body using said mixture; said molding step including injecting said mixture with said plastic in molten form into a cavity having the form of said body and through a gating orifice on said axis, said orifice opening radially into said cavity uninterruptedly completely around said axis whereby the molten mixture fills said cavity uniformly radially from said orifice, said orifice being of a size in relation to said particles which causes at least some of said particles to become physically oriented in a common direction as they enter said cavity, and causing said molten plastic to solidify thereby securing said particles in position, said particles being thus dispersed substantially uniformly throughout the solidified body.

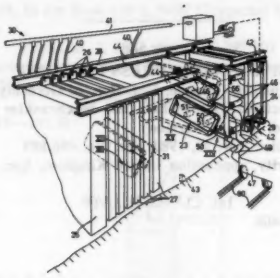
4,496,304

MOULD FOR SHAPING SYNTHETIC MATERIAL AND MOULD FOR RENOVATING A CARRYING BOARD

Hendrik Bouwhuis, Nieuwe Haven 24, Hardenberg, Netherlands

PCT No. PCT/NL82/00003, § 371 Date Oct. 1, 1982, § 102(e) Date Oct. 1, 1982, PCT Pub. No. WO82/02698, PCT Pub. Date Aug. 19, 1982
PCT Filed Feb. 4, 1982, Ser. No. 438,884
Int. Cl.³ B29C *1/00*
U.S. Cl. 425—569 **7 Claims**

1. A device for producing carrying boards to be used in the production of bricks, thereby giving the boards a predetermined thickness, comprising: a series of plural moulds, each of the plural moulds of each of said series of moulds being a peripheral mould frame sandwiched between an associated pair of spaced, opposed carrier plates of a battery of a plurality of movable carrier plates; said battery having common high pressure closing means for moving said carrier plates toward each other into said spaced relation so as to sandwich said moulds firmly therebetween, said moulds having inlets out of contact with said spaced carrier plates which are individually connectable to a common outlet of a common resin injection



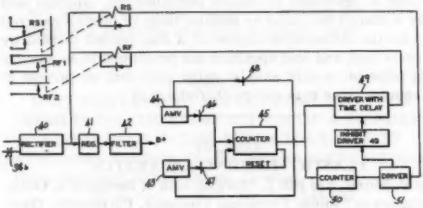
moulding device, said common outlet being movable to the individual inlets of said series of moulds, said plural mould frames being vertically spaced and positioned with open ends facing opposing movable carrier plates.

4,496,305

IGNITION CONTROL CIRCUIT FOR A BOILER SYSTEM

Joseph W. Bentz, Clinton, Conn., assignor to Precision Timer Co., Inc., Westbrook, Conn.

Continuation-in-part of Ser. No. 387,246, Jun. 10, 1982, abandoned. This application Aug. 12, 1983, Ser. No. 522,522
Int. Cl.³ F23C *11/04*
U.S. Cl. 431—1 **10 Claims**



1. A circuit for providing a predetermined number of pulses between predetermined time intervals comprising first and second pulse generators, said first generator providing pulses having a substantially longer period than said second generator, a pulse counter providing an output upon overflow, means coupling said pulse generators to said counter, said second generator being inhibited by absence of one output state of said counter, but rendered active upon occurrence of the other output state of said counter, whereby when said first generator is operating, said counter generates an output pulse upon overflow and enables said second generator, and terminates the output pulse upon overflow of counts of pulses from said second generator, means applying the overflow from said counter due to said first generator to an ignition circuit, means for counting the number of pulses applied to said ignition circuit, and means responsive to said means for counting reaching a predetermined number for inhibiting input of pulses to said ignition circuit.

4,496,306

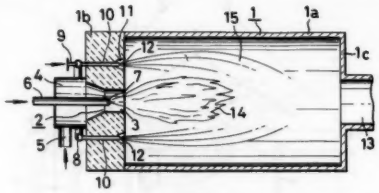
MULTI-STAGE COMBUSTION METHOD FOR INHIBITING FORMATION OF NITROGEN OXIDES

Noboru Okigami; Hiroshi Hayasaka; Yoshitoshi Sekiguchi, and Harushige Tamura, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Continuation of Ser. No. 914,146, Jun. 9, 1978, abandoned. This application Apr. 18, 1984, Ser. No. 601,105

Int. Cl.³ F23M *3/02*

U.S. Cl. 431—8 6 Claims



1. A multi-stage combustion method for inhibiting the formation of nitrogen oxides comprising injecting a primary fuel and primary air into a furnace at an upstream end thereof to burn the fuel and form a first-stage combustion zone downstream of said end, the primary air being supplied at a rate in excess of the stoichiometric rate required for the combustion of the primary fuel, so that a ratio of air actually provided to air stoichiometrically required for combustion is at least 1.4 in the first-stage combustion zone, and injecting only a secondary fuel in the absense of air into the furnace at said upstream end in a plurality of streams spaced from a location of injecting said primary fuel and primary air into the vicinity of the first-stage combustion zone at a rate approximately equal to the stoichiometric rate required for the consumption of the excess oxygen resulting from the combustion in the first-stage zone and diluting the secondary fuel with surrounding combustion gas prior to combusting with said excess oxygen to form a second stage combustion zone spaced from a location of injecting of said plurality of streams and in the vicinity of the first-stage zone.

4,496,307

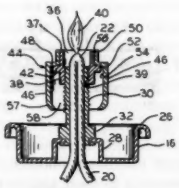
CANDLE INCLUDING FLAME ADJUSTMENT MEANS AND AUTOMATIC FLAME EXTINGUISHER MEANS

Jack L. Ginardi, Western Springs, Ill., assignor to Valley Candle Mfg. Co., Inc., Brooklyn, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,425

Int. Cl.³ F23Q *25/00*

U.S. Cl. 431—34 13 Claims



1. A candle comprising:

a receptacle terminating into an open end;

a combustible fuel contained in the receptacle;

a cap covering said open end and having an opening therethrough;

a hollow tubular member secured to the cap;

a wick passing through said cap and tubular member, so that an upper tip portion of the wick protrudes out from the outermost end of the tubular member and a bottom portion of the wick extends into the fuel, said tip being the location for the candle flame;

a flame adjuster movable along said tubular member for varying the intensity of the flame, said flame adjustor including a support means secured to the outside thereof and having an upper side and a lower side; and

a flame extinquisher means normally supported on said upper side of said support means, said flame extinquisher means being slightly movable in a lateral direction for contacting the flame adjustor to enable outward and inward adjustment of the position of the flame adjuster, said flame extinquisher means being freely movable in an outward direction to extend over the flame for extinquishing the flame when the candle tilts over or becomes unstable; and

the lower side of the support means cooperating with the flame extinquisher means to prevent the flame extinquisher means from flying off the candle when said flame extinquisher extends over the flame.

4,496,308

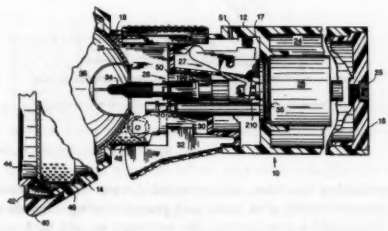
SHOCK MOUNTING FOR INCANDESCENT MANTLE

George P. Gruner, Andover, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 16, 1982, Ser. No. 408,553

Int. Cl.³ F21H *7/00*

U.S. Cl. 431—101 10 Claims



1. A hand-held lighting device powered by a combustible fuel and including a mantle, comprising a housing, an elongated cantilevered member anchored within said housing and mantle mounting means disposed at the unanchored end of said cantilevered member, said cantilevered member including axial shock absorbing means including a first elongated member, a second elongated member coaxially and slidingly mated with said first member and biasing means for biasing relative coaxial movement between said first and second members, said shock absorbing means including knuckle joint means for canting a first portion of said cantilevered member with respect to a second portion of said cantilevered member in response to transverse shock forces acting on said device.

4,496,309

LIQUID GAS-OPERATED LIGHTER, PARTICULARLY POCKET LIGHTER

Friedrich Schächter, Draschestrasse 31, A-1232 Vienna, Austria

PCT No. PCT/AT82/00004, § 371 Date Nov. 19, 1982, § 102(e) Date Nov. 19, 1982, PCT Pub. No. WO82/03262, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 18, 1982, Ser. No. 444,594

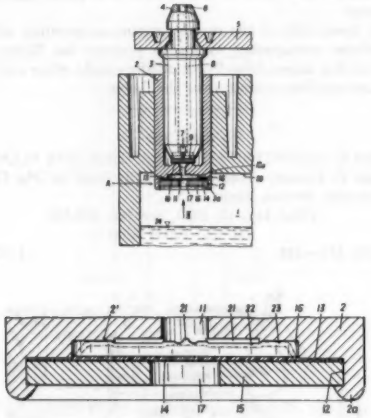
Claims priority, application Austria, Mar. 19, 1981, 1306/81

Int. Cl.³ F23D *13/04*

U.S. Cl. 431—344 9 Claims

1. Liquid-gas operated lighter, such as isobutane gas operated pocket lighter, comprising a burner tip, a closable valve in communication with said burner tip, a valve bore having first and second openings, said first opening arranged adjacent said closable valve, a fuel tank and a non-adjustable control device

arranged between said tank and said valve bore, an annular surface facing said fuel tank and having a recess of limited depth, said recess defining an end face extending transversely to said bore, said end face arranged contiguous with said second opening of said valve bore, a structural component having a passage for fuel, a proportioning disk whose periphery is pressed in a gas tight manner by said structural component against said annular surface, said proportioning disk formed by a fuel-permeable flexible film having microscopically small individual pores permitting flow of gas through said proportioning disk essentially perpendicularly to the film surface, said recess, said end face and said proportioning disk defining a



proportioning chamber, said control device being formed by said proportioning disk and said proportioning chamber, so that when said valve is open the pressure in said tank causes said proportioning disk to be deflected in the direction of said second opening into said proportioning chamber toward said end face, a texture including recessed portions formed in the surface of said end face for controlling flow of gas from said proportioning disk toward said valve bore when said proportioning disk is in contact with said end face, said texture in said end face closing more and more pores of said proportioning disk as the pressure difference between the pressure in the tank and the ambient pressure increases in dependence upon the temperature.

4,496,310

BURNER FOR PRODUCING A FLOW OF HOT GAS IN PARTICULAR FOR SHRINKING A PLASTIC FOIL

Rainer W. Hannen, Goch, Fed. Rep. of Germany, assignor to MSK-Verpackungs-Systeme GmbH, Kleve, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,670

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226615

Int. Cl.³ F23D *13/24*

U.S. Cl. 431—350 **17 Claims**

1. A burner for producing a flow of hot gas, in particular for shrinking a plastic foil, comprising:

(a) Mixture inlet means;

(b) a pressure distribution chamber connected to and in flow communication with said inlet means;

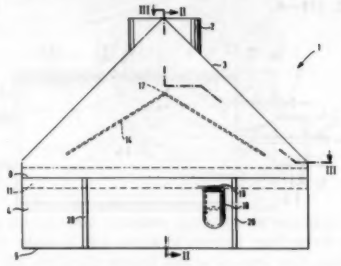
(c) a transition section connected to and in flow communication with said pressure distribution chamber;

(d) a combustion chamber connected to and in flow communication with said transition section and said combustion chamber having a discharge opening;

(e) said combustion chamber have an elongated inlet of substantial length in cross section;

(f) said transition section being tapered and having substantial planar side walls converging on said inlet of said combustion chamber;

(g) a flame holder positioned substantially in said transition section generally in the area of connection of said transi-



tion section with said combustion chamber and said flame holder having a length substantially equal to said inlet length and thereby substantially spanning said combustion chamber inlet; and,

(h) said flame holder is a substantially cylindrical member positioned in close proximity with said side walls and therewith forming passageway gaps adapted for accelerating flow of a mixture to said combustion chamber.

4,496,311

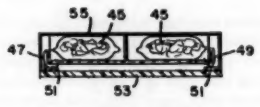
MULTILAMP PHOTOFLASH ARRAY FABRICATION

Donald E. Armstrong, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 359,467, Mar. 18, 1982,. This application May 4, 1984, Ser. No. 607,030

Int. Cl.³ F21K *5/00*

U.S. Cl. 431—359 **5 Claims**



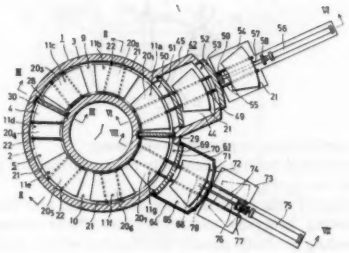
1. A miniaturized multilamp photoflash array comprising a circuit board having a printed circuit on the inner surface thereof, a reflector unit affixed to said circuit board and having a plurality of cavities, a plurality of photoflash lamps with each lamp disposed within a cavity and a transparent cover member telescoped over said photoflash lamps, reflector unit and printed circuit and affixed to said circuit board, said array characterized by the improvement wherein each of said lamps includes a pair of electrically conductive leads passing through, embedded in and wrapped about one of the ends of said reflector unit whereby each of said lamps is nested within a cavity of said reflector unit.

4,496,312

HEAT-TREATMENT SYSTEM AND PROCESS

Shunsuke Yamada; Kenji Kawate; Takashi Ono; Hideo Arakawa, and Tsuyoshi Suda, all of Aichi, Japan, assignors to Daidotokushuko Kabushikikaisha, Japan

Filed Jun. 1, 1983, Ser. No. 502,779
Claims priority, application Japan, Jun. 9, 1982, 57-99075
Int. Cl.³ F27D *3/00;* F27B *9/16, 9/02*
U.S. Cl. 432—11 6 Claims



1. A heat-treatment system comprising:

(a) a hollow furnace comprising a circular enclosure body having an exterior wall provided with an opening for supplying a material to be treated from exterior to interior and an opening for discharging the material to be treated from interior to exterior;

(b) moving means for circulating and moving the material to be treated along a predetermined locus within said furnace body;

(c) the interior of said furnace being provided with a plurality of stay spaces each having an area capable of positioning the material to be treated and equidistantly spaced from each other along said locus;

(d) the number of said stay spaces being a value obtained by adding 1 to a value twice the repetition frequency (N) of heating and cooling applied to the material to be treated, such that (2N+1) represents said value;

(e) a part of the space within said furnace body being partitioned by partioning walls so as to include consecutive stay spaces of at least the number (N) equal to said repetition frequency, to form heating areas;

(f) a part of the space within said furnace body being partitioned by partitioning walls so as to include consecutive stay spaces of at least the number (N) equal to said repetition frequency, to form cooling areas;

(g) the respective partitioning walls of said heating and cooling areas being positioned within said locus and provided with movable doors for permitting the material to be treated to move between the heating chamber and cooling chamber; and

(h) moving means for alternately transferring the material between the heating chamber and cooling chamber, by a predetermined distance so that the place to which the material is transferred will always be a new stay space in each chamber not previously occupied during the transferring cycle between heating and cooling; and

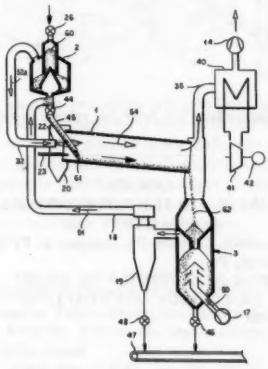
(i) said furnace having an enclosed means for receiving material to be preheated, projecting radially from the exterior wall thereof, said supply opening registering with the interior of said enclosed means and a removable closure means for said opening.

4,496,313

METHOD OF CALCINING MINERALS CONTAINING HEAT-VALUE COMPONENTS

Wolfram Quittkat, Gauting; Gerhard Reuter, Aschheim, and Rüdiger Schmidt, Munich, all of Fed. Rep. of Germany, assignors to BKMI Industrieanlagen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,247
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 3146891
Int. Cl.³ F27B *15/00;* C04B *7/02*
U.S. Cl. 432—14 2 Claims



1. A method of calcining mineral matter containing heat value in the form of volatilizable combustible organic substances, comprising the steps of:

(a) burning a gas mixture of air and said volatilizable substances from the volatilization thereof and calcining the mineral matter following removal of at least a substantial portion of said volatilizable substances therefrom to form a hot calcined product at a location different from that at which the removal was effected;

(b) recovering heat from said hot calcined product; and

(c) subjecting the mineral matter containing the volatilizable substances to the recovered heat at a location different from that at which calcination occurs to drive said volatilizable substances from said mineral matter containing same to thereby form a combustible gas mixture from said substances for use in step (a) and a mineral matter from which said substances have been removed for calcination in a repetition of step (a) for the latter mineral matter, said hot product being subjected to cooling with air, said gas mixture in step (a) including cooling air heated by said hot product, the volatilizable substances being driven out of said mineral matter by passing same and a hot gas in codirectional flow in a rotary furnace and thereafter passing the burning gas mixture and said mineral matter for calcination in a codirectional flow through a rotary furnace.

4,496,314

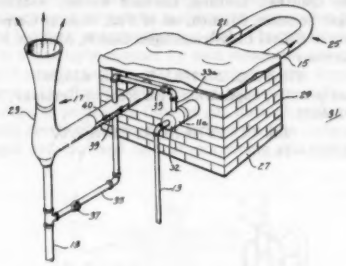
RECUPERATOR

Beresford N Clarke, 3723 W. Hamilton Rd., Fort Wayne, Ind. 46819

Filed Feb. 28, 1983, Ser. No. 470,213
Int. Cl.³ F27B *5/14;* F23D *11/44;* F24C *3/00*
U.S. Cl. 432—29 18 Claims

9. The method of reducing heat loss from a radiant tube type fuel burner system having a burner unit near one tube end for introducing a combustible fuel-air mixture into the tube com-

prising the steps of: transferring heat from exhaust gas within the tube to combustion air to be supplied to the burner; and



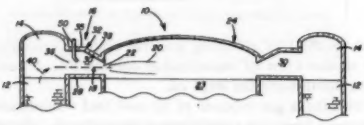
reflecting radiation heat loss from the system through the tube ends.

4,496,315

PORT WALL AIR JET FOR CONTROLLING COMBUSTION AIR

Edward P. Savolskis, Carlisle, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1983, Ser. No. 510,807
Int. Cl.³ F24H *7/00*; F27D *17/00*
U.S. Cl. 432—30 **11 Claims**



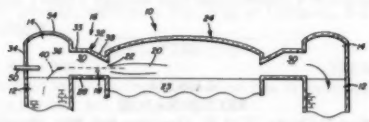
1. A method of operating a regenerative furnace wherein combustion gas is preheated in a regenerator bed and then is passed to a plenum communicating along its length with a plurality of ports through which the combustion gas passes into the furnace, and fuel is combined with the combustion gas at the ports; the improvement comprising apportioning the flow of combustion gas among the plurality of ports by injecting a stream of gas into at least one of the ports so as to affect the portion of the combustion gas flowing therethrough.

4,496,316

TARGET WALL AIR JET FOR CONTROLLING COMBUSTION AIR

Yih-Wan Tsai, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1983, Ser. No. 510,808
Int. Cl.³ F24H *7/00*; F27D *17/00*
U.S. Cl. 432—30 **12 Claims**



1. A method of operating a regenerative furnace wherein combustion gas is preheated in a regenerator bed and then is passed to a plenum communicating along its length with a plurality of ports through which the combustion gas passes into the furnace, and fuel is combined with the combustion gas at the ports; the improvement comprising apportioning the flow of combustion gas among the plurality of ports by injecting a stream of gas in the plenum at the entrance to at least one of the ports so as to affect the portion of the combustion gas entering that port.

4,496,317

ADJUSTABLE ORTHODONTIC APPLIANCE

Charles M. Hulsey, 911 E. Valley Parkway, Escondido, Calif. 92025

Filed Jun. 27, 1983, Ser. No. 507,731
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—10 **13 Claims**

1. An orthodontic appliance, comprising:

a base member having a generally planar surface for attachment to a tooth,

an elongated arm secured at an inner end to said base and extending generally parallel to said planar surface for extending generally parallel to a tooth to which the base is attached and terminating at an outer end at a position offset from said base and from the crown of the tooth, and

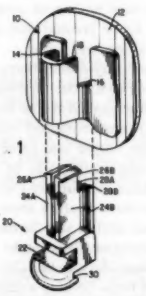
a wire lock comprising a wire receiving slot and closure means for closing said slot mounted on the outer end of said arm for attachment of an arch wire.

4,496,318

CONVERTERS FOR ORTHODONTIC TREATMENT

Harold R. Connelly, Jr., 2499 Main St., Stratford, Conn. 06497

Filed May 17, 1982, Ser. No. 379,089
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—14 **17 Claims**



1. An orthodontic converter for adapting a first appliance member associated with an orthodontic treatment system of a first type, for use with an orthodontic treatment system of a second type, the first appliance member having a notch for receipt of an archwire associated with an orthodontic treatment system of the first type, the first appliance member defining a channel and having a peripheral edge at one end thereof, which comprises, a second appliance member having integral clip means formed of a pair of separable flexible snap clip members configured and dimensioned for insertion through the channel so that said snap clip members flex toward each other during insertion through the channel and for snap locking engagement against the peripheral edge so as to provide for selective attachment and detachment to the first appliance member, said second appliance member defining cut-out means

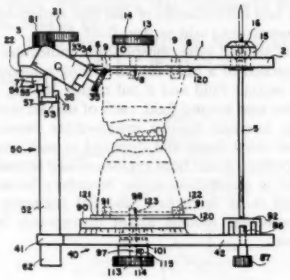
for reception of an archwire associated with said second system.

4,496,319

DENTAL ARTICULATOR WITH SPATIALLY ORIENTED MOUNTING TABLE

Allen F. Steinbock, Louisville, Ky., assignor to Whip-Mix Corporation, Louisville, Ky.

Filed Aug. 19, 1982, Ser. No. 409,592
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—57 **14 Claims**



1. A dental articulator for the support of dental casts in opposed relation to each other, including:

A. an upper frame;

B. a lower frame;

C. a joint means, simulating the mandibular condylar joint for mounting said upper and lower frames together at the rear end, for movement in a manner simulating the movement of the mandible relative to the maxilla;

D. mounting plates for attachment to said frames for mounting of dental casts in opposed relation to each other;

E. a mounting plate table, having a planar surface on one side and being permanently bonded on the other side to one of said frames at the frame's mid-portion in precise vertical and horizontal planar relation to the other frame for mounting of one of said mounting plates in precise vertical and horizontal planar relation to said other mounting plate;

1. said precise vertical and horizontal planar relation of said mounting plate table, relative to one frame, having been established by a standard gauge means positioned between the upper and lower frames at both the mid-portion and front of said frames; and

F. bonding means for permanently securing said mounting plate table to one of said frames in precise vertical and horizontal planar relation to said other frame.

4,496,320

CONNECTION OF TRAY TO DENTAL ARTICULATOR

Chong S. Hwang, Flushing, and Barry Lampert, Lloyd Harbor, both of N.Y., assignors to Rab Tec Products Corp., Freeport, N.Y.

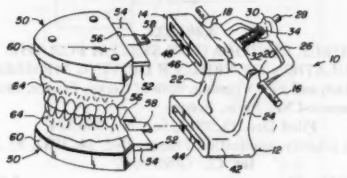
Filed Aug. 22, 1983, Ser. No. 525,447
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—60 **4 Claims**

1. An improved connection of tray to dental articulator having a lower jaw and an upper jaw pivotally mounted to the lower jaw which comprises:

(a) a lower member having a female receiving aperture, said lower member carried by the lower jaw;

(b) an upper member having a female receiving aperture, said upper member carried by the upper jaw; wherein the female receiving apertures in said lower and said upper members being of the same size, rectangular formed and tapered inwardly from an edge thereof; and

(c) a dental model tray for each said member being formed with a male hold-release portion being sized to releasably mount within either of the female receiving apertures, wherein the male hold-release portion being formed as a rectangular tapered projection extending outwardly from a back portion of said dental model tray thereof and having a semi-flexible central tab extending outwardly form



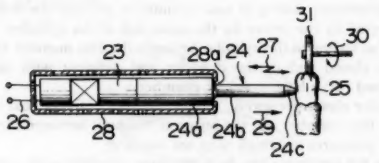
said rectangular projection whereby said tab will flex a little and will automatically lock with said member, said male hold-release portion being fully inserted into the female receiving aperture, and whereby said tab will flex in an opposite direction when finger pressure is applied thereby releasing said tab and said male hold-release portion from the female receiving aperture.

4,496,321

VIBRATION METHOD FOR CUTTING TEETH

Junichiro Kumabe, Tokyo, Japan, and Masaru Kumabe, 1-1, Ise 4-Chome, Kofu-shi, Yamanashi, Japan, assignors to Masaru Kumabe, Kofu, Japan

Filed Jun. 1, 1982, Ser. No. 383,622
Claims priority, application Japan, Aug. 24, 1981, 56-132515
Int. Cl.³ A61C *5/00*
U.S. Cl. 433—215 **11 Claims**



1. A method of cutting a tooth with a cutting tool having a tip which rotates at a high speed, comprising the steps of: exciting a tooth to be cut for vibration at a frequency which is greater than the natural frequency of the tooth, bringing the cutting tool into contact with the vibrationally-excited tooth to be cut under a suitable pressure, and operating the cutting tool such that the feed rate of the cutting tool is less than the maximum vibrational speed of the tooth, as viewed in the feed direction, to effect cutting of the tooth.

4,496,322

BENZOIN ANTIMICROBIAL DENTAL VARNISHES

H. James Sandham, Thorhill, and Thomas E. Balanyk, Toronto, both of Canada, assignors to University of Toronto Innovations Foundation, Toronto, Canada

Filed May 11, 1983, Ser. No. 493,755
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—217 **5 Claims**

1. A dental varnish composition suitable for painting onto teeth to combat oral infection, said composition consisting essentially of:

an orally acceptable liquid vehicle;

benzoin;

and at least one dentally acceptable antimicrobial agent selected from the group consisting of erythromycin,

chlorhexidine and salts thereof and compatible with the liquid vehicle and the benzoin;

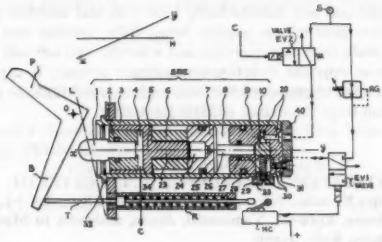
said composition being capable of drying to form a solid transparent, translucent or tooth colored coating on teeth to which it is applied and releasing said at least one antimicrobial agent over a sustained period of time into contact with infected sites on said teeth.

4,496,323

FORCE RESTORATION SYSTEM FOR THE SIMULATION OF VEHICLE DRIVING MEMBERS

Robert Alet, and Eric Vignault, both of Cergy, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 13, 1983, Ser. No. 560,974
Claims priority, application France, Dec. 14, 1982, 82 20966
Int. Cl.³ G09B 9/02
U.S. Cl. 434—29 **5 Claims**



1. A force restoration system for the simulation of vehicle driving members, which comprises:

an envelope forming a cylinder open at one end and closed at the other;

a first member sliding in said cylinder to receive the thrust exerted by the driver by the open end of the cylinder;

a piston sliding in the cylinder between the first member and the closed end of the cylinder and defining with said closed end a back-pressure chamber;

a tubular elastomer spring, whose ends respectively bear on the first member and the piston to transmit between them the pressures to which they are exposed;

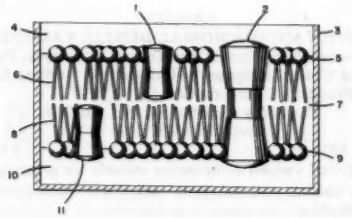
means for supplying the back-pressure chamber with compressed air, when the first member reaches a given position in the cylinder.

4,496,324

BIOMEMBRANE DEMONSTRATION APPARATUS

Werner W. Schulz, 3525 Norcross La., Dallas, Tex. 75229

Filed Sep. 29, 1982, Ser. No. 428,391
Int. Cl.³ G09B 23/36
U.S. Cl. 434—295 **4 Claims**



1. A biomembrane demonstration apparatus, comprising:

a transparent fluid containing vessel;

a first fluid disposed in said vessel and having a first density;

a second fluid disposed in said vessel and having a density less than said first density;

a third fluid disposed in said vessel and having a density less than said second density, said first, second and third fluids being transparent;

a plurality of first type phospholipid molecular models, each comprised of a head region having a greater density than said second fluid and a tail region having a density less than said second fluid, each of said first models having an average density intermediate between said first and second densities and disposed on said container such that said head region of said first molecular models maintain a position at the boundary between said first and second fluids and said tail segments of said first molecular models orient upwards into said second fluid; and

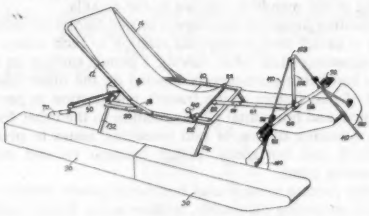
a plurality of second type phospholipid molecular models, each comprised of a head region having a lower density than said second fluid and a tail region having a higher density than said second fluid, each of said second models having an average density intermediate between said second and third fluids and disposed in said vessel such that the position of said head regions of said second molecular model is maintained at the boundary between said second and third fluids and said tail segments of said second molecular models orient downwards into said second fluid.

4,496,325

COLLAPSIBLE PADDLE BOAT

Edward Tweg, 51 Shderot Herzl, Ramle, Israel

Filed Aug. 12, 1982, Ser. No. 407,463
Claims priority, application Israel, May 13, 1982, 65768
Int. Cl.³ B63H 16/12
U.S. Cl. 440—26 **9 Claims**



1. A foldable, portable paddle boat comprising:

a main frame;

foldable driving and propelling means pivotably mounted upon said frame;

said foldable driving and propelling means comprising:

a stationary base element pivotably mounted onto said main frame and defining a first rotation axis;

a crank shaft defining at least one arm and an axle portion rotatably mounted onto said stationary base for rotation about said first rotation axis;

a stationary extension element pivotably coupled to said base element and defining a second rotation axis parallel to and spaced from said first rotation axis;

at least one rod rotatably mounted onto said extension element and arranged for rotation about said second rotation axis through a restricted arc; and

a member arranged for slideable relative movement with relation to said at least one rod and fixedly mounted onto said at least one arm, whereby rotation of said arm about said first rotation axis causes said member to move slideably with relation to said rod and cause its rotation about said second rotation axis;

a paddle coupled to said member;

said paddle being adapted for movement along the length of said rod as it rotates through said restricted arc such that

said paddle remains in a substantially vertical orientation throughout its movement;

steering means foldably mounted upon said frame; and a plurality of floats;

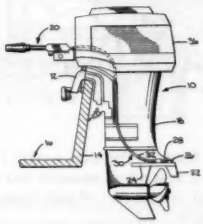
said frame being removably mountable upon said floats.

4,496,326

SELECTIVELY DISENGAGEABLE, TILLER ACTUATED VANE STEERING SYSTEM

James C. Boda, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 20, 1982, Ser. No. 451,611
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—62 **10 Claims**



1. A steering system for a marine drive having a propulsion unit pivotally mounted on a watercraft for moving and steering the watercraft through the water, said marine drive further having a tiller, said steering system comprising:

a steering vane rotatably mounted on the propulsion unit for generating a hydrodynamic torque on the propulsion unit upon rotation tending to pivot the propulsion unit with respect to the watercraft;

mounting means intermediate the propulsion unit and the tiller for mounting the tiller on the propulsion unit, said mounting means being operable to a first condition in which the tiller can move relative to the propulsion unit and to a second condition in which the tiller does not move relative to the propulsion unit; and

means coupling the tiller to said steering vane for causing movement of the tiller with respect to the propulsion unit to rotate said steering vane, the tiller being movable in a direction other than said last mentioned movement to operate said mounting means between said conditions.

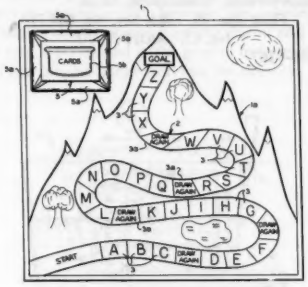
4,496,327

EDUCATIONAL GAME

Robert A. Bennett, 11042 Lakeview Dr., Whitehouse, Ohio 43571

Filed Nov. 12, 1982, Ser. No. 440,876
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—249 **10 Claims**

1. An educational game comprising a playing board, means defining a random path on said board extending from a starting position to a goal position; said random path comprising a sequence of spaces containing educational characters selected from a group of letters of the alphabet and simple words, said letters of the alphabet being arranged in proper sequence from said start position to said goal; a set of playing cards, at least one of said cards having one of said educational characters represented thereon and a plurality of number cards each having a number represented thereon; and a marker for each player; said marker being moved toward or away from said goal to the educational character on said path corresponding to the educational character appearing on said one card when drawn by the player and whereby a player drawing a number



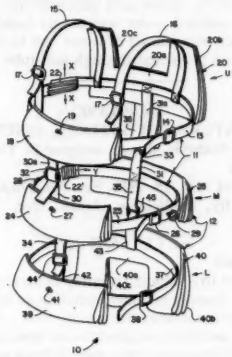
card may advance said player's marker a number of said spaces corresponding to the number on the drawn card.

4,496,328

COMBINED SWIMMING AID AND LIFESAVING DEVICE

William P. Asher, Rte. 3, Harness Creek, Annapolis, Md. 21403, and Otto J. Munz, deceased, late of Arlington, Va. (by Gerta H. Munz, executrix)

Division of Ser. No. 296,062, Aug. 25, 1981, abandoned. This application Mar. 19, 1984, Ser. No. 590,863
Int. Cl.³ B63C *9/12*
U.S. Cl. 441—55 **6 Claims**



1. A combined swimming aid and lifesaving device, comprising:

a torso-encircling buoyant harness means for releasable attachment to the body of a swimmer to impart substantially neutral equilibrium to the swimmer;

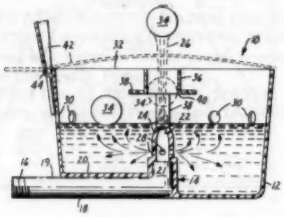
a plurality of separate inflatable buoyant means carried by the harness for selective inflation to impart desired buoyancy to the swimmer; and

said buoyant means remaining at least partially slack when inflated and having a narrower leading edge than trailing edge, and having accordian or bellows-like pleats or folds along the leading and trailing edges, whereby the buoyant means presents a streamlined configuration for passage through water and said buoyant means may undulate to reduce drag during use.

4,496,329
WATER JET TOY

James F. Kubiatowicz, Fridley, Minn., assignor to Custom Concepts, Incorporated, Minneapolis, Minn.

Filed Apr. 29, 1983, Ser. No. 489,710
Int. Cl.³ A63H 29/10
U.S. Cl. 446—167 6 Claims



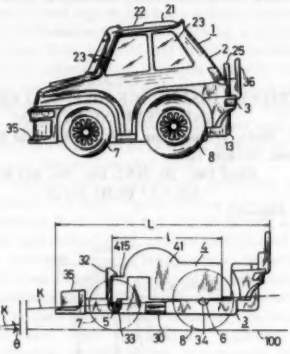
1. A water-activated toy comprising:
a bowl adapted for containing water;
a water-distribution assembly at the bottom of said bowl adapted to be coupled to a source of water under pressure, said assembly including means for directing water into said bowl, for agitating water within said bowl, and for forming and directing a jet of water along a path vertically upwardly from within said bowl;
means for maintaining water at a predetermined level within said bowl slightly above the beginning of said jet of water;
a plurality of light, buoyant generally spherical objects having similar diameter dimensions adapted to float on the agitated water within said bowl;
a tube having an axis, an inlet end, and an inside diameter slightly larger than said object diameter; and
means for supporting said tube on said bowl with said axis vertically oriented coaxial with said path and said inlet end sufficiently above said predetermined level that an object on agitated water within said bowl that is moved into contact with the jet of water can be drawn into said inlet end and projected through said tube by said jet.

4,496,330
MINIATURE TOY VEHICLE ASSEMBLY

Masumi Terui, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,622
Claims priority, application Japan, Dec. 29, 1982, 57-201732[U]
Int. Cl.³ A63H 29/00
U.S. Cl. 446—464 19 Claims

1. A miniature toy vehicle assembly consisting of:
a plastic resin housing member including an upper body shell and a lower frame member;
a front wheel assembly attached to said housing member and including a front axle and a pair of front wheels;
a rear wheel assembly attached to said housing member and including a rear axle and a pair of rear wheels; and
a motor assembly having a spring-powered prime mover attached to said housing member and adapted to drive the rear axle of said rear wheel assembly,
wherein said motor assembly is fixed to a substantially central portion of the upper surface of said lower frame member, the ratio (l/L) of the length (l) of said motor assembly to the length (L) of said lower frame member being approximately 0.5;
said front axle is rotatably supported in the vicinity of the longitudinal front end of said motor assembly, the distance between said front axle and said rear axle being within the range of the length (l) of said motor assembly;
said front axle and said rear axle are attached to said housing member so that when said miniature toy vehicle assembly is placed on a flat support surface, the plane including said front axle and rear axle will intersect said flat support surface in front of said front axle at a predetermined angle (θ); and

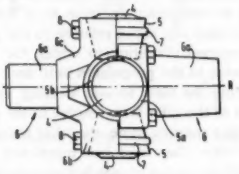


the relationship between the total weight (w) of said front wheel assembly, rear wheel assembly and motor assembly, and the overall weight (W) of said miniature toy vehicle assembly is: $w/W > 0.5$.

4,496,331
FLEXIBLE COUPLINGS

Howard S. Atkin, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Jan. 25, 1982, Ser. No. 342,414
Claims priority, application United Kingdom, Feb. 13, 1981, 8104573; Apr. 2, 1981, 8110411
Int. Cl.³ F16D 3/28
U.S. Cl. 464—70 18 Claims



1. A flexible coupling for connecting two rotatable components lying along an axis of rotation comprising:
a driven component and a driving component with a torque transmitting means radially disposed between said components;
said torque transmitting means comprising at least two separate elements, each element having a central portion in a common plane generally transverse to said axis of rotation, each element further having inclined limbs depending from said central portions, said inclined limbs lying along radius lines and in said transverse plane, one limb of each element being connected to the driving component and the other limb of each element being connected to the driven component and the driving and driven components respectively being connected by the limbs of each element at substantially diametrically opposed points;
bearing means on each inclined limb, said bearing means permitting rotation of a respective limb about an axis inclined relative to the normal axis of rotation of the coupling; means connecting said bearing means to said driving and driven components so as to permit axial move-

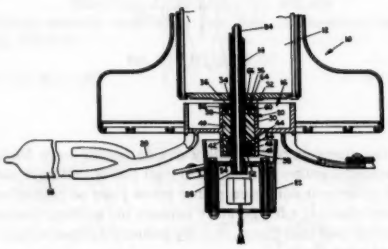
ment between said components by the limb of one element rotating about the axis of the other limb of that element.

4,496,332

ROTARY VIBRATION ISOLATOR BUSHING

Frederick P. Keller, Grand Rapids, and Theodore C. Zwiep, Holland, both of Mich., assignors to Cascade Engineering, Inc., Grand Rapids, Mich.

Filed Feb. 25, 1982, Ser. No. 352,307
Int. Cl.³ F16D *3/72, 3/76*
U.S. Cl. 464—89 **10 Claims**



1. In a rotary fan device including a rotatable cylindrical hub, a rotary drive shaft coaxially mounted within said hub with an annular space therebetween, and bushing means for operatively connecting said shaft with said hub for transmitting torque from said shaft to said hub and for dampening vibrations in said shaft and hub, the improvement comprising:

a bushing constructed of elastomeric material and mounted in the annular space in a substantially uncompressed state so as to maintain vibration dampening properties of said elastomeric material;

said bushing having first and second end surfaces each having a central aperture therein and a central bore extending therethrough between said end surfaces, said central bore having a diameter slightly larger than a diameter of said shaft;

said shaft having an end portion terminating within said central bore and close to the second end surface;

hub fastening means located adjacent said first end surface for rigidly connecting said first end surface of said bushing to said hub; and

shaft fastening means for rigidly connecting said end portion of said shaft to said bushing adjacent said second end surface, wherein a substantial axial length of said bushing extends between said hub fastening means and said shaft fastening means, and said bushing is adjacent and unconnected to both said hub and said shaft along said axial length so as to provide vibration dampening of said shaft and hub.

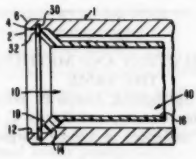
4,496,333

LOW FRICTION POWER TAKEOFF SHAFT

Donald C. Cleveland, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 21, 1982, Ser. No. 400,515
Int. Cl.³ F16D *3/06*
U.S. Cl. 464—162 **1 Claim**

1. A low friction telecopying power takeoff shaft apparatus having a first hollow shaft with an opening in one end, an inner surface having an inner wall portion defining an elongated cylindrical recess extending axially inward from the end of said first hollow shaft, the inner surface of said shaft having at least a portion with a non-round cross section adjacent said inner wall portion for receiving a second shaft having a non-round cross section, a non-round friction-reducing lower sleeve is interposed between the second shaft and the inner surface of the first shaft, said sleeve has an outer end spaced slightly axially outward from the inner surface portion with a non-round cross section, said outer end of the sleeve has a radially outwardly extending annular flange which is positioned in said recess, an annular groove provided in the inner wall portion, said groove is spaced axially between the opening and the annular flange a short distance from the end of said first shaft, a retainer ring is positioned in the groove in front of at least a portion of the annular flange to retain the sleeve in fixed position relative to the first shaft, the inner wall portion has plural circumferentially spaced cavities, the flange has complementing plural circumferentially spaced lobes, which fit in the cavities of the inner wall portion, the retainer ring is a split washer-like device with flat radial walls having a relatively narrow cylindrical mid-portion and having relatively axially enlarged spaced end portions with openings therein for inserting a tool to circumferentially compress the retainer ring for inserting and removing the ring.

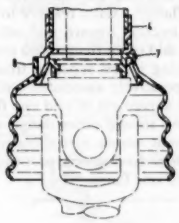


4,496,334

GUARD FOR A DRIVE SHAFT

Felix Mikeska, Siegburg, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,786
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208541
Int. Cl.³ F16D *3/84*
U.S. Cl. 464—175 **7 Claims**



1. A guard for enclosing a drive shaft assembly including a drive shaft and a universal joint connected to the drive shaft, comprising axially extending tubular means for laterally enclosing the drive shaft assembly, a bearing ring arranged to engage the drive shaft assembly so that it is secured against axial displacement on the assembly, said bearing ring having radially outwardly directed locking tongues, said tubular means includes a stop surface, said tubular means being axially displaceable over and relative to said bearing ring until said stop surface contacts said bearing ring, wherein the improvement comprises that said tubular means has axially extending passageways arranged to be aligned with and to receive said locking tongues so that said tubular means can be moved axially relative to said bearing ring with said locking tongues located within said passageways during such axial movement, said tubular means includes an axially extending funnel-shaped member, a tubular member, and an intermediate tubular part interconnecting said funnel-shaped member and said tubular member, said passageways being formed by said funnel-shaped

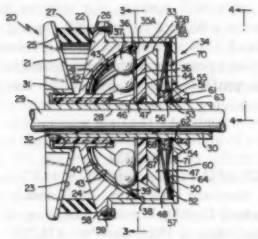
member, said stop surface is formed on said intermediate tubular part, said funnel-shaped member having an end surface extending transversely of the axis thereof and spaced closely axially from and facing said stop surface, sand said funnel-shaped member being rotatable about the axis thereof from the position with said bearing ring in contact with said stop surface where said tongues aligned with said passageways to a position where said tongues are spaced angularly from said passageways and are located between said stop surface and said end surface on said funnel-shaped member, and said tubular means are held on the drive shaft assembly against axial displacement.

4,496,335

PULLEY CONSTRUCTION AND METHOD OF MAKING THE SAME

Terrence R. Quick, Springfield; Joseph P. Miranti, Jr., Porter Township; Christian County, and Randy C. Foster, Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Dec. 13, 1982, Ser. No. 449,046
Int. Cl.³ F16H *11/06*
U.S. Cl. 474—15 **10 Claims**



1. In a pulley construction having a pair of opposed flanges respectively provided with surface means for engagement with a V-belt construction when said V-belt construction is disposed therebetween, said pulley construction having means for moving one of said flanges axially relative to the other of said flanges either in a direction toward said other flange or in a direction away from said other flange, said pulley construction having fluid dampening means separate from said means for moving and being operatively associated with said one flange to dampen said axial movement of said one flange in either of said directions relative to said other flange with a restrictive force, the improvement within said dampening means comprises a flexible bladder having one part thereof operatively interconnected to said one flange.

4,496,336

PULLEY DEVICE

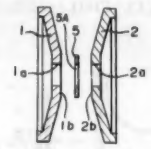
Akio Matsumoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,104
Int. Cl.³ F16H *55/42, 55/36*
U.S. Cl. 474—181 **1 Claim**

1. A pulley device having an axis of rotation and a V-groove for passing a V-belt, said pulley device comprising:

(a) a pair of steel plates formed by stamping, said steel plates having centrally located, mutually opposing planar surfaces perpendicular to the axis of rotation of said pulley device and diverging away from each other to form the V-groove outwardly of said centrally located planar surfaces; (b) a generally planar metal plate formed from a metal having a melting temperature lower than the melting temperature of said steel plates and selected from the group consisting of copper and copper alloys sandwiched between said steel plates so as to make planar contact with said planar surfaces on said steel plates, the ratio of the thickness of said planar metal plate to the thickness of said steel plates being less than 1:10, said planar metal plate being coextensive with said planar surfaces on said steel plates and being positioned so as to prevent contact between said steel plates in the welded, assembled condition of the pulley device;

(c) said steel plates and said planar metal plate having concentric, axial through-holes therethrough for receiving a shaft; and



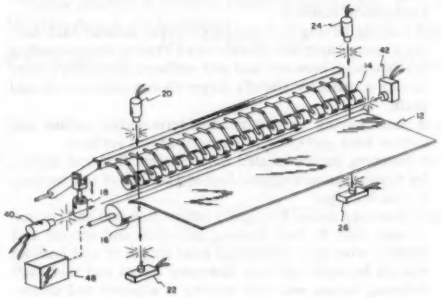
(d) the elements of the pulley device having been friction welded together by rotating at least one of said steel plates so as to melt bond said planar metal plate to both of said steel plates at a temperature beneath the melting temperature of said steel plates, thereby minimizing heat stresses in said steel plates.

4,496,337

CONTROL APPARATUS FOR FOLDING MACHINE

Raymond P. Meenen, Hawthorne, N.J., assignor to Mayflower Electronic Devices Inc., Little Ferry, N.J.

Filed Jul. 6, 1983, Ser. No. 511,188
Int. Cl.³ B65H *45/18*
U.S. Cl. 493—14 **7 Claims**



1. In a folding machine having a horizontally elongated input plate with front and rear horizontal edges, a mechanism including input wheels disposed at the rear edge, said mechanism having a first position at which said wheels are disposed above the plate and a second position at which said wheels are lowered to said plate, a horizontally elongated roller rotatable about its own axis and disposed at the rear edge, said wheels being engaged with the roller when the mechanism is in the second position and a motor for rotating said roller, in combination:

first and second spaced apart photoelectric circuits, each circuit producing a vertical light beam, which, when not interrupted, passes said rear edge, said beams defining a vertical plane;

a third photoelectric circuit producing a horizontal light beam which, when not interrupted, passes horizontally along said rear edge parallel to said plane;

first means connected between said first and second circuits and said mechanism and responsive to the interruption of

both vertical beams when material to be folded is placed upon said plate in the path of both beams to place said mechanism in said second position, said mechanism being otherwise in the first position; and

second means coupled to said first means, said third circuit and said motor to actuate said motor and rotate said roller only when said mechanism is in the second position and the horizontal beam is not interrupted.

4,496,338

FOLDING BLADE CYLINDER

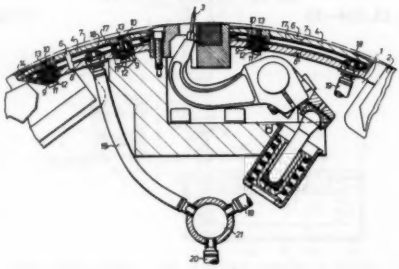
Horst B. Michalik, Hochberg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,606

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217169

Int. Cl.³ B21B *13/02*

U.S. Cl. 493—367 **8 Claims**



1. A folding blade cylinder for use in a rotary printing machine, said folding blade cylinder comprising:

a plurality of slots spaced side by side in the direction of the longitudinal axis of said cylinder and extending circumferentially around a portion of the periphery of said cylinder;

a plurality of radially adjustable carrying bows disposed in said slots and biased radially inwardly in said slots;

expandable means positioned within said slots radially inwardly of said carrying bows; and

means for pressurizing said expandable means to force said carrying bows radially outwardly against said inward bias.

4,496,339

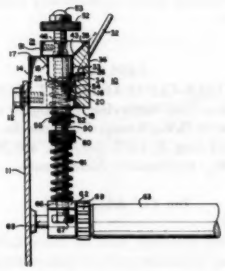
APPARATUS FOR SETTING ROLLER CLEARANCE

Richard J. Moll, c/o Dick Moll & Sons 415 Constance Dr., Warminster, Pa. 18974

Filed Apr. 18, 1983, Ser. No. 485,730

Int. Cl.³ B65H *45/14*

U.S. Cl. 493—420 **5 Claims**



1. In apparatus for setting roller clearances in machines for folding paper having at least one pair of rollers, said pair having one stationary roller and one roller axially movable therefrom with at least one arm extending from said movable roller, the improvement which comprises

a stem block secured to said machine,

said stem block having top and bottom walls, and a front wall,

an angularly related wall connected to said top wall and said front wall,

an upper and lower passageway extending from said top wall to said bottom wall,

a transverse passageway in said block extending perpendicularly to said upper passageway,

a shaft in said transverse passageway,

said shaft including a central portion with a shoulder,

actuation means engaged with said shaft for rotation thereof,

a gage block,

said gage block having an extension slidably engaged in said upper and said lower passageways,

said gage block having top and bottom walls,

a front angularly related wall connecting said gage block top and bottom walls at the same angle as said angularly related wall of said stem block,

said gage block extension having a shoulder for engagement with said shoulder of said transverse shaft in said stem block,

spring means on said extension,

stem means engaged with said stem block and one of said roller arms,

said stem means including spring means between said first mentioned spring means and said roller arm.

4,496,340

SCREW CENTRIFUGE WITH A WASHING DEVICE

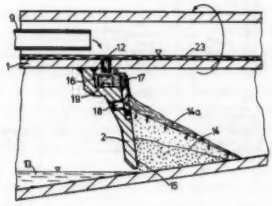
Detmar Redeker, Cologne, and Dieter Mrotzek, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,465

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216393

Int. Cl.³ B04B *15/12*

U.S. Cl. 494—29 **11 Claims**



1. In a screw centrifuge having a drum and a screw core forming a cylindrical clarifying part and a conical desiccating part, an axial supply pipe into the screw core for a washing liquid and openings in the screw core for the passage of the washing liquid into a chamber between the drum and the screw core, the improvement comprising: liquid distributing means in communication with the openings and positioned around the screw core axis along a cylindrical helix for regularly distributing the washing liquid along the screw flank over at least one turn in the vicinity of the screw core, wherein the liquid distributing means comprises an overflow channel having a weir and wherein the overflow channel is positioned in the screw flank.

4,496,341

APPARATUS FOR VAGINAL MEDICATION APPLICATION

Anton B. Brucks, 9601 Trailhill, Dallas, Tex. 75238

Filed Apr. 12, 1982, Ser. No. 367,167
Int. Cl.³ A61F *15/00*
U.S. Cl. 604—14 **4 Claims**

1. Apparatus for use in the repetitive intravaginal application of medication comprising:

a reversable hollow tubular member suitable for vaginal insertion;

a separate, disposable flexible tubular membrane having a closed end and an open end and adapted to be disposed in sleeved relationship with and along the exterior surface of said hollow tubular member covering substantially all of said hollow tubular member, said closed end adapted to be axially depressed into a first end of said hollow tubular member wherein a cavity is formed within said first end of said hollow tubular member for receiving medication; and

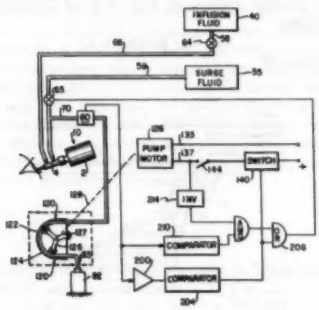
a piston member, adapted to be inserted into a second end of said hollow tubular member for outwardly extending said closed end of said tubular membrane whereby said medication may be dispensed without contamination of said hollow tubular member and said piston member.

4,496,342

SURGE PREVENTION SYSTEM FOR AN OPHTHALMIC INSTRUMENT

Anton Banko, Bronx, N.Y., assignor to Surgical Design Corporation, Long Island City, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,664
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—27 **8 Claims**



1. A material removal system for an ophthalmic instrument comprising:

instrument means having an evacuation port for placement into an operating site and a flow line communicating with said evacuation port of said instrument means for evacuating material from said site,

pump means communicating with said flow line for creating a liquid fluid flow through said flow line,

means for sensing the rate of fluid flow in said flow line,

a source of liquid, means for admitting liquid from said source into said flow line at a point between the evacuation port of said instrument and said pump means,

means including comparator means coupled to said sensing means for producing a signal corresponding to a rapid rate change going from a low fluid flow rate condition such that if the flow line were clogged to a high fluid flow rate condition in said flow line above a predetermined level, and

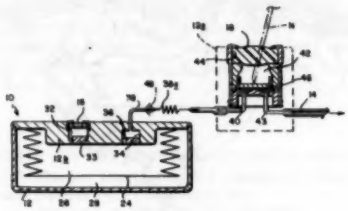
means responsive to said signal for operating said liquid admitting means to supply the liquid from said source into said flow line to aid in filling the empty volume in said line and to tend to equalize the pressure in said line between the operating site and said pump means and for stopping the operation of said pump means.

4,496,343

INFUSATE PUMP

Frank R. Prosl, Duxbury, and Edward J. Sampson, Carlisle, both of Mass., assignors to Infusaid Corporation, Norwood, Mass.

Continuation of Ser. No. 388,483, Jun. 14, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,301
Int. Cl.³ A61M *5/00, 31/00*
U.S. Cl. 604—86 **7 Claims**



1. Implantable infusion apparatus comprising:

A. an infusate reservoir;

B. an entry port into said infusate reservoir;

C. a self-sealing penetrable septum closing said entry port;

D. a small fixed-volume chamber;

E. an entry port into said chamber;

F. a second self-sealing penetrable septum closing the entry port into said chamber, the exposed surfaces of both said septa being located near one another in substantially the same plane or in parallel planes to that, when the apparatus is implanted in the body, both said septa are accessible extracorporeally by transcutaneous injection at nearby locations on the body surface;

G. means defining a fluid inlet passage extending from said reservoir to said chamber;

H. means for moving the contents of said reservoir to said chamber; and

I. means defining a substantially unrestricted fluid outlet passage from said chamber for connection to a conduit leading to an infusion site so that an injection of infusate into said chamber flows substantially immediately to the infusion site.

4,496,344

MULTIPLE-COMPARTMENT SYRINGE

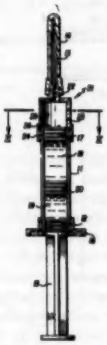
Paulus R. Kamstra, Olst, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands

Filed Aug. 5, 1982, Ser. No. 405,366
Claims priority, application Netherlands, Aug. 10, 1981, 8103745
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—90 **6 Claims**

1. A syringe for injecting two or more different injection liquids which may not be in contact with each other for a long period of time, comprising:

a rotationally symmetrical barrel which is open at each end, to which barrel a finger grip means is connectable;

a piston which is movable in the barrel and seals same, to which piston a piston rod is connectable;
a needle or means to connect same to the front end of the barrel;
a sealing stopper, the dimensions of which are such that it can be provided sealingly in the opening on the front end of the barrel;
at least one separating stopper to be provided in the barrel and movable therein, said stopper having a circumference that sealingly adjoins the inner wall of the barrel, thereby keeping the injection liquids present in the barrel separated from each other prior to use of the syringe; and
a needle holder comprising a collar which is sealingly engageable with the front end of the barrel; a neck for seal-



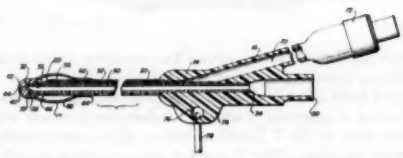
able attachment to an injection needle; a hollow shaft between the collar and the neck; a plurality of spacing supports included in the rear face of the neck; and a passage formed in the inner wall of the shaft and the rear face of the neck, said syringe being characterized in that the space bounded by the inner wall of the shaft and the spacing supports on the rear face of the neck has the same or a slightly larger circumference than the circumference of the inner wall of the barrel and is slightly longer than the length of the collective stoppers, so that in the extreme forward position the collective stoppers can substantially entirely fill said space, in which however at least one opening remains between the stoppers and the inner wall of the shaft, said opening extending to a point behind the stoppers.

4,496,345

BALLOONED CANNULA

Harrith M. Hasson, 2043 N. Sedgwick, Chicago, Ill. 60614

Filed Aug. 30, 1982, Ser. No. 413,152
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—103 **7 Claims**



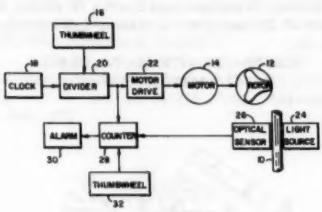
1. In a ballooned cannula, the combination of an elongated tube having two spaced ports in fluid communication with each other via the interior of the tube;
a housing formed of a biologically inert, soft plastic material surrounding said tube along the length thereof and having an end disposed such that at least one end of said tube extends from said housing, said housing including
an inlet in fluid communication with one of said ports, a pressurizing conduit extending to substantially said housing end, and a
pressurizing port in fluid communication with said conduit and adapted to be connected to a source of pressurizing fluid; and
a biologically inert, expandable one piece balloon secured to said tube one end and comprised of a radially inner integral sleeve disposed about said tube one end, a radially outer integral sleeve of thin construction connected and sealed to said housing near said housing end, and a smooth tip interconnecting said sleeves adjacent said tube one end and having an outlet in fluid communication with the other of said ports, the interface of said sleeves being in fluid communication with said pressurizing conduit, said radially inner sleeve having a lesser axial length than said radially outer sleeve, said other port being defined by an open end of said tube, and said outlet opening into the interior of said radially inner sleeve.

4,496,346

INFUSION MONITORING APPARATUS

Thomas F. Mosteller, Lansdale, Pa., assignor to Air-Shields, Inc., Hatboro, Pa.

Filed Aug. 17, 1983, Ser. No. 523,870
Int. Cl.³ A61M *5/14*
U.S. Cl. 604—123 **13 Claims**



1. Infusion monitoring apparatus comprising:
an infusion tube for conducting liquid;
sensing means responsive to fluid flow through said infusion tube for sensing the presence of gas bubbles in said liquid and for developing a control signal having a first characteristic representative of liquid flow through said infusion tube and a second characteristic representative of a gas bubble flowing through said infusion tube;
timing means for developing a series of timing signals having a rate proportional to the rate of fluid flow through said infusion tube;
counting means responsive to said second characteristic of said control signal and said timing signals for counting said timing signals during the presence of a gas bubble and for developing an alarm signal after a predetermined number of said timing signals have been counted;
and an alarm means responsive to said alarm signal for developing an alarm.

4,496,347

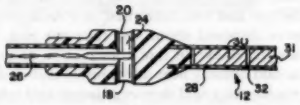
FEEDING TUBE STYLET

David MacLean, and Robert B. Edwards, II, both of Libertyville, Ill., assignors to Viridian, Inc., Wheeling, Ill.

Filed Sep. 24, 1982, Ser. No. 422,564
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—164 **2 Claims**

1. A wire stylet for use with a feeding tube assembly for

selective enteric administration and aspiration of fluids to and from the gastrointestinal tract of a patient, the assembly including a flexible tube for conducting fluids having at least one aperture in the tube wall near the distal end of said tube; and having a weighted guide tip on the distal end of said tube; said stylet including a single strand of wire insertable into said tube for aiding the insertion of said feeding tube assembly into said patient and extendable throughout the length of said tube, said



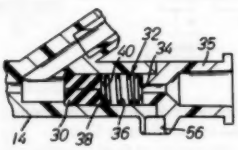
wire being bent upon itself and having its two resulting ends twisted about each other simultaneously forming a double helix configuration and an elongated continuing loop at its distal end, the width of said elongated loop being slightly less than the diameter of said tube but greater than the major diameter of said apertures, whereby said loop is inhibited from exiting said apertures when guiding the tube internally, while allowing for the free flow of fluids from said tube even though said stylet remains inserted into said tube.

4,496,348

VENIPUNCTURE DEVICE

Joseph N. Genese, Waukegan, and Charles H. Seberg, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 29, 1979, Ser. No. 98,566
Int. Cl.³ A61M 5/00, 25/00
U.S. Cl. 604—167 **3 Claims**



1. An improved venipuncture device comprising catheter means having a catheter hub attached thereto at a first end;

needle means having needle hub means attached thereto at a first end and a sharpened tip at a second end, said needle means extending coaxially through said catheter means with said sharpened tip extending from said catheter means at a second end and being adapted for insertion and removal from said catheter means;

a penetrable elastic sealing member positioned within and adapted for sealing said catheter hub;

compression means for the compression of said penetrable elastic sealing member coincident with the longitudinal axis of said penetrable elastic sealing member, said compression means having an aperture therethrough for the passage of said needle means;

said compression means being constructed and arranged to reseal the opening through said penetrable elastic sealing member created by the withdrawal of said needle means from said penetrable elastic sealing member;

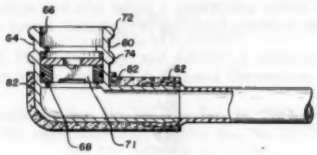
said compression means comprising; a plurality of spring members coaxially aligned and juxtaposed to said penetrable elastic sealing member for the compression of said penetrable elastic sealing member.

4,496,349

PERCUTANEOUS IMPLANT

Louis C. Cosentino, Wayzata, Minn., assignor to Renal Systems, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 261,719, May 8, 1981, abandoned, which is a continuation of Ser. No. 138,579, Apr. 8, 1980, abandoned. This application Oct. 26, 1981, Ser. No. 314,569
Int. Cl.³ A61M 5/00
U.S. Cl. 604—175 **3 Claims**



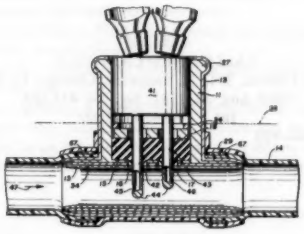
1. A surgically implantable percutaneous device for providing communication between an animal body exterior and an animal body interior the device comprising a rigid, flangeless tubular body of biologically compatible material, said tubular body having an exterior surface including a smooth upper portion which extends through the skin when implanted and a lower portion entirely below the surface of the skin when implanted, said lower portion including a porous tissue ingrowth media thereon for anchoring the device to the animal body, said tubular body including in the interior thereof an elastomeric septum member and means for holding said septum member in sealed relationship therein, said septum member defining an excutaneous cavity within the device.

4,496,350

BLOOD ACCESS DEVICE

Louis C. Cosentino, Wayzata, Minn., assignor to Renal Systems, Inc., Minneapolis, Minn.

Continuation of Ser. No. 261,719, May 8, 1981, abandoned, which is a continuation of Ser. No. 138,579, Apr. 8, 1980, abandoned. This application Jun. 23, 1983, Ser. No. 507,197
Int. Cl.³ A61M 5/00
U.S. Cl. 604—175 **21 Claims**



1. An implantable access device for providing access to the circulatory system comprising:

a rigid body of biologically compatible material, said body having a generally T-shaped tubular configuration with the stem of the T joined to and in fluid communication with the arms of the T, support means internal to and at the junction of the stem and arms, a elastomeric septum member within the stem having first and second sides and positioned therein so that a portion of said first side is contiguous with and supported by said support means with the remaining portion of said first side that is exposed to the tube of said arms generally parallel with the upper

inner surface of said arms, and septum retaining means within said stem member above said second side for compressively supporting said septum member therein in fixed relationship to said arms thereby sealing said stem opening when it is positioned within the cavity of said stem.

4,496,351

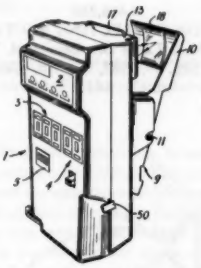
INFUSION MONITOR

Arie Hillel, White Plains, N.Y., and Simcha Borovsky, Givatayim, Israel, assignors to Ipco Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 365,595, Apr. 5, 1982, abandoned. This application Jun. 9, 1983, Ser. No. 502,585

Int. Cl.³ A61M *5/16*

U.S. Cl. 604—250 **7 Claims**



1. An infusion monitor comprising a cartridge, sensing means operatively associated with said cartridge for monitoring the flow of liquid in a transparent infusion tube assembly, said sensing means comprising a sensing beam for sensing a liquid being infused through said transparent infusion tube assembly, means for directing said sensing beam from said cartridge, a movable clamp assembly pivotly mounted on said cartridge, reflecting means on said clamp assembly for redirecting said sensing beam back toward said cartridge, said cartridge having openings therein for said sensing beam, said reflecting means being opposite said openings, an emitter and a receiver for said sensing beam within said cartridge adjacent said openings, said clamp assembly being movable relative to said openings to reflect said beam and to permit the cartridge to be mounted on said infusion tube assembly and support said cartridge on said infusion tube assembly.

4,496,352

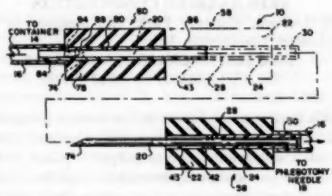
CANNULA SUPPORT ASSEMBLY AND ITS METHOD OF MANUFACTURE

Emil H. Soika, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 326,739, Dec. 2, 1981, Pat. No. 4,413,992. This application Oct. 6, 1983, Ser. No. 517,546

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—263 **9 Claims**



1. An assembly for supporting a cannula having an operative end and for interconnecting the cannula to a fluid conduit, said assembly comprising

a hub including

a first member having a bore, and

a second member having opposite end portions and occupying a portion of said bore with one of said end portions disposed outwardly of said bore for attachment to the fluid conduit, the opposite end portion thereof being confined within said portion of said bore, said second member further including a bore extending between said opposite end portions and accommodating the cannula with the operative end thereof extending from said confined end portion of said second member and outwardly beyond said first member bore, and

a cover including

an outer member, and

an inner member having an open interior and including a main body portion carried within said outer member and an end portion disposed outwardly of said outer member, said outwardly disposed end portion being removably engageable in an interference fit relationship within the remaining portion of said first member bore not occupied by said second member to secure said cover to said hub with the outwardly extending operative cannula end enclosed within said open interior.

4,496,353

HOLLOW SURGICAL DISPOSABLE NEEDLE, PREFERABLY OF THE REDON TYPE

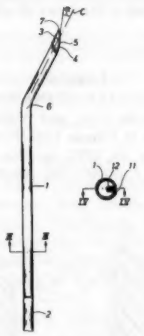
Christian Overland, L.O. Rasmussensvej 10, DK-3390 Hundested, Denmark, and Knud-Werner Gaarde, Bakkegaardsvej 108, DK-3050 Humlebaek, Denmark

Filed Sep. 9, 1982, Ser. No. 416,371

Claims priority, application Denmark, Sep. 11, 1981, 4056/81

Int. Cl.³ A61M *27/00*

U.S. Cl. 604—272 **7 Claims**



1. A disposable surgical needle to be used for drawing a flexible drain catheter into a body comprising:

an elongated strip of material having longitudinal edges and forming a tubular shaped needle body,

the longitudinal edges abutting each other along the length of the needle body and extending generally radially inwardly from the peripheral edge of the needle body,

the anterior end of the needle body having a flat planar section extending through and parallel to the abutting longitudinal edges,

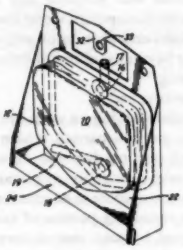
the planar portion having an edge extending diagonally to the longitudinal axis of the tubular needle body and defining a cutting edge, the posterior end being capable of receiving the catheter.

4,496,354

DRAINAGE BAG ASSEMBLY WITH DRIP TRAY

Peter L. Steer, and John V. Edwards, both of Sussex, England, assignors to Craig Medical Products Limited, Sussex, England

Filed Nov. 22, 1982, Ser. No. 443,812
Claims priority, application United Kingdom, Nov. 23, 1981, 8135253
Int. Cl.³ A61M 1/00
U.S. Cl. 604—322 6 Claims



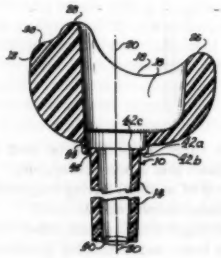
1. A self-supporting closed body drainage bag assembly comprising a first wall formed of a substantially rigid sheet of liquid-impermeable material and a second wall formed of a flexible liquid-impermeable material, said second wall secured to said first wall so as to define a container, said first wall extending beyond the upper and lower edges of said second wall and having wing portions extending beyond the side edges of said second wall, said first wall wing portions being folded forwardly and said first wall extended lower portion being folded and joined to said folded wing portion to form a drip tray means extending beneath said container, said upper extended first wall having at least one hole above said container that serves in use as a hanger, and at least two aperture means forming the inlet and outlet in said first wall for communicating within the confines of the container to one of which is fixed an inlet fitting and to the other of which is fixed an outlet fitting.

4,496,355

EXTERNAL FEMALE URINARY APPLIANCE

Kenneth F. Hall, Arvada, Colo., and William H. Beecher, Elmhurst, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 16, 1982, Ser. No. 442,068
Int. Cl.³ A61M 1/00; A61F 5/44
U.S. Cl. 604—327 12 Claims



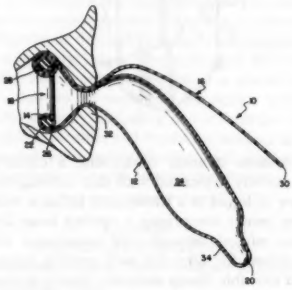
1. A one-piece external female urine collection receptacle adapted to be positioned within the labia folds of the user and in contact with the vestibular tissue around the meatus defining the urethral opening, said device comprising a generally ovoid and open cup-shaped member having a cavity and a generally centrally disposed open bore opening through said member defining a vertical axis of the receptacle, the upper periphery of said member having an inner and outer adjacent generally locally outwardly protuberant exterior surfaces around the bore opening, and a substantially continuously curved ridge extending upwardly from the upper periphery of the receptacle defining the upper portions of said cavity within said receptacle, said upper periphery and ridge generally defining a generally adjacent pair of sealing surfaces, said receptacle having a substantially elliptical cross section in a plane perpendicular to the vertical axis, said sealing surfaces having a concave surface along a major axis of the elliptical cross section and a convex surface along a minor axis of the elliptical cross section said inner one of said adjacent surfaces generally disposed farther vertically relative to an outer one of said adjacent surfaces, for sealingly and continuously contacting and engaging with the labia folds and said vestibular tissue.

4,496,356

ANAL EXCRETION COLLECTING RECTAL CATHETER

Leon Lognion, 2730 E. Lucas Dr., Beaumont, Tex. 77703

Filed Sep. 29, 1982, Ser. No. 426,999
Int. Cl.³ A61F 5/44
U.S. Cl. 604—328 8 Claims



1. A rectal catheter insertable in a patient's anus for collecting excretions, comprising:

an excretion receiving tube having an open end and a closed end;

a solid ring of resilient material fixed to said tube open end; and

a thin, elongated flexible member means having opposite first and second longitudinal ends, said first end being secured to said ring, said second end being detached from said tube and forming a free end of said flexible member, said flexible member extending exteriorly of said tube from said first end and extending over and into said open end of said tube;

whereby, the device can be easily removed from the anus of a patient by pulling said flexible member means.

4,496,357

SKIN BARRIER COMPOSITION

Frank G. Osburn, Hanover Park, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Jun. 10, 1981, Ser. No. 272,192
Int. Cl.³ A61F 5/44; B01J 13/00
U.S. Cl. 604—336 8 Claims

1. A skin barrier composition in the form of integral rings or blankets for application around a stoma composed substantially entirely of a continuous polyisobutylene phase having dispersed therein particulate hydrocolloid together with fumed silica, said composition containing on a weight percent basis from 50 to 90% of the polyisobutylene phase, from 10 to 35% hydrocolloid, and from 1 to 10% fumed silica, at least 3 parts

by weight of said polyisobutylene phase being present per part of said hydrocolloid.

4,496,358

DIAPER HAVING VARIABLE DENSITY ABSORBENT PAD

Hamzeh Karami, Embourg; Myriam Delvaux, Hannut, and Terence Cooper, Embourg, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,327
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—379 **4 Claims**

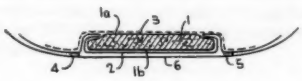
1. A disposable diaper comprising, in order, a top sheet, an absorbent pad assembly including a fist absorbent pad, a second absorbent pad separate from said first pad and below said first pad, wadding means including an upper wadding layer above said first pad, and a lower wadding layer below said second pad, said wadding means enveloping both said pads, and a water impervious backing sheet, and water spray means integrally stabilizing said lower wadding layer to said second pad while varying the density of said second pad increasingly away from said top sheet.

4,496,359

SANITARY ARTICLES TO ABSORB BODY LIQUIDS

Raymond Pigneul, Durrenentzen, France, assignor to Beghin-Say S.A., Thumeries, France

PCT No. PCT/FR82/00055, § 371 Date Nov. 18, 1982, § 102(e) Date Nov. 18, 1982, PCT Pub. No. WO82/03170, PCT Pub. Date Sep. 30, 1982
PCT Filed Mar. 19, 1982, Ser. No. 445,374
Claims priority, application France, Mar. 19, 1981, 81 05477
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—387 **7 Claims**



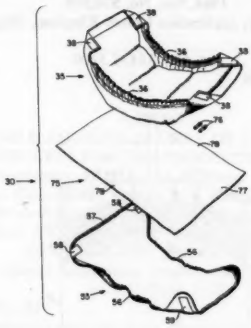
1. Sanitary article to absorb body liquids of the type including an absorbing-material pad (**1, 11**) with one side facing the human body, clad by a liquid-permeable sheet (**3, 13**) to be in contact with the body, and an opposite side, clad by an external liquid-impermeable sheet (**2, 12**), characterized in that said external liquid-impermeable sheet (**2, 12**) envelops said pad on said opposite side (**1*b*, 11*b***) over the entire thickness of said pad and then is pleated along the longitudinal edges of that pad side (**1*a*, 11*a***) which faces the human body so as to extend beyond each longitudinal edge to form side-ways extensions (**2*a*, 2*b*/12*a*, 12*b***) beyond the surface bounded by the absorbing pad (**1, 11**).

4,496,360

METHOD OF USING A COMPOSITE WASTE-CONTAINMENT GARMENT HAVING DISPOSABLE ELASTICIZED INSERT

Frederick M. Joffe, and John K. Dysart, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 27, 1983, Ser. No. 508,443
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—397 **7 Claims**



1. A method of using an elasticized-leg-cuff waste-containment insert having a predetermined degree of elastic induced contractability of said leg-cuffs in a non-elasticized over-garment, said method comprising the steps of:

stretching said insert to substantially reduce its elastic induced contraction;

securing longitudinally spaced oppositely disposed end portions of said insert to equally longitudinally spaced inwardly facing surface regions of said over-garment while said insert is maintained in said reduced state of contraction; and

so applying said over-garment to a wearer that the elasticized-leg-cuffs of said insert are sufficiently stretched to be sealingly juxtaposed the wearer's skin by the action of stretching induced tension.

4,496,361

PLATELET STORAGE CONTAINER

Henn Kilkson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 290,328, Aug. 5, 1981, abandoned. This application Jun. 29, 1982, Ser. No. 392,295
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—408 **7 Claims**

1. A method of storing platelet concentrate comprising placing the concentrate in a container, sealing the container, maintaining a temperature of 22° C., and agitating said container, with the proviso that the container is made from a copolymeric film material capable of being heat sealed at a low temperature and having

an oxygen permeability of at least about 1.8×10^5 μm^3 (STP)/(m^2.sec.Pa),

a carbon dioxide permeability of from about 4.4×10^5 to about 8.0×10^5 μm^3 (STP)/(m^2.sec.Pa),

a tensile strength of at least about 8 mPa,

a seal strength of at least about 1000 g/cm,

a stiffness low enough that the container can be extended by liquid to a capacity of about 275 ml,

a durability sufficient to provide a dart drop value of at least about 100, and

a thickness of from about 0.08 to about 0.23 mm.

4,496,362

CONTAINER FOR LIQUIDS FOR USE IN MEDICINE AND SURGERY

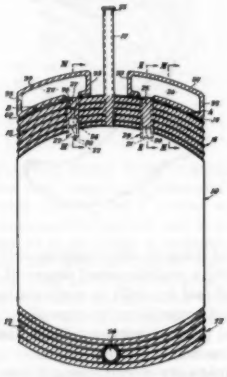
Hendrik J. Leurink, Torenwer, Netherlands, assignor to Stichtig Centraal Laboratorium Van De Bloedtrasfusiedienst Van Het Nederlandse Rode Kruis, Amsterdam, Netherlands

Continuation of Ser. No. 197,476, Oct. 16, 1980, Pat. No. 4,439,192, which is a continuation of Ser. No. 95,975, Nov. 20, 1979, abandoned, which is a continuation of Ser. No. 869,102, Jan. 13, 1978, abandoned, which is a continuation of Ser. No. 690,731, May 27, 1976, abandoned. This application Jan. 12, 1984, Ser. No. 570,519

Claims priority, application United Kingdom, May 30, 1975, 23632/75

Int. Cl.[3] A61M *5/00*

U.S. Cl. 604—408 8 Claims



1. A container for liquids, comprising:

opposing layers of flexible plastic film, end joints joining said layers of film together at their ends and said layers being enclosed in the longitudinal direction along the sides, between said ends, to define an enclosure for liquid,

at least one of said end joints including a peel resistant fusion weld, at least a first portion of which extends continuously across said end joint,

at least one duct of plastic material sealed between said layers at said end joint, and extending in the said longitudinal direction, the inner end of said duct communicating with the inside of said enclosure, at least a finite width of said first portion, taken in the axial direction relative to the duct, being non-peelably fusion welded to the exterior of the duct, about its entire circumference, such that the continuous fusion weld is continuous around the circumference of the duct,

a rupturable obstruction within the duct,

an expansion chamber formed at said end joint, between facing portions of the two layers which are unattached to each other, said expansion chamber communicating with the outer end of the duct,

closing means at said end joint which completely and non-peelably encloses said expansion chamber except for its communication with the outer end of the duct, said closing means including, at least in part, said fusion weld, the area of said expansion chamber confined by the layers and the closing means being dimensioned to accommodate during sterilization, without pressure induced film separation at said welds, expansion of gas contained in the combined space of said chamber and the portion of the duct outwardly of said obstruction and communicating with the expansion chamber,

means in said first portion of the fusion weld for defining a tear line in said end joint beneath the expansion chamber, exposing the outer end of the duct when the end joint is torn along the tear line, said obstruction being spaced below the tear line, such that at least a part of the said finite width of the first portion, in the region between the tear line and the obstruction, remains after tearing along the tear line.

4,496,363

ANTIMICROBIAL FABRICS

Louis J. DeFilippi, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 21, 1983, Ser. No. 554,491
Int. Cl.[3] D06M *13/18, 15/66*
U.S. Cl. 8—115.5 16 Claims

1. An antimicrobial product comprising an aminoalkylsilylated fabric whose terminal amino functionality is covalently bonded to one terminus of a polyfunctional spacer moiety, with another terminus of the polyfunctional spacer moiety covalently bonded to an amino group of an antimicrobial agent.

4,496,364

METHOD OF DYEING VOLUMINOUS SUBSTRATES WITH ANIONIC DYES

Hans-Peter Stakelbeck, Binzen, Fed. Rep. of Germany, assignor to Sandoz Ltd., Basel, Switzerland

Filed Apr. 25, 1983, Ser. No. 488,009
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215872; May 21, 1982, 3219115
Int. Cl.[3] D06P *3/06, 3/24*
U.S. Cl. 8—641 20 Claims

1. In a process wherein a dyeing liquor containing one or more anionic dyestuffs is applied to a voluminous flat form synthetic polyamide substrate at a liquor:goods ratio below 10:1 and the thus-treated substrate is rolled up and rotated at a temperature of 20°–60° C. to effect fixation of the dyestuff, the improvement which comprises (1) employing a dyeing liquor which contains no thickening, swelling or foaming agent and which has an initial pH within a range, depending on the affinity of the substrate for anionic dyestuffs and on the molecular weight of the anionic dyestuffs, as will give a substantially linear exhaustion of the dyeing liquor, and (2) applying the dyeing liquor to the substrate in an amount such that it flows on the rolled-up substrate during the rotation thereof.

4,496,365

METHOD OF PRODUCING BRIQUETTES FROM ORGANIC WASTE PRODUCTS

Rolf W. Lindemann, Birkenhügel 6, Ritterhude, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 242,126, Mar. 9, 1981, abandoned. This application Jul. 27, 1983, Ser. No. 517,922
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1980, 3010259
Int. Cl.[3] C10L *5/44, 5/46*
U.S. Cl. 44—1 D 2 Claims

1. A method of producing fuel briquettes from organic waste products by enriching waste products with organic materials of high heating value, such as coal, comprising compressing the organic waste products with the addition to them, together with coal or other organic products of high heating value used for enriching, lime (CaO) under high pressures of at least 1000 bar whereupon a compressing process with reaction temperatures of about 100°–120° C. results and a product of a desired high heating value is obtained.

4,496,366

CONFIGURED FUEL BRIQUET AND METHOD

Susan M. Peters, Livermore, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Nov. 10, 1982, Ser. No. 440,688
Int. Cl.[3] C10L *5/36*
U.S. Cl. 44—14 13 Claims

1. A charcoal briquet having a geometry configured to produce a selected burn performance including a first ignition phase and a second, burn phase, said briquet being configured to provide an ignition phase defined as a selected percent of visual ash on the outer surface of the briquet formed in a preselected time.

2. The charcoal briquet of claim 1 in which said ignition phase is selected as 20 minutes and the briquet is configured in accordance with the equation:

$$\text{Desired Percent Visual Ash} = -207(V \cdot d/A + 163).$$

6. A method of constructing a fuel briquet to provide desired ignition time comprising empirically deriving an ignition time formula for said desired ignition time as a function of briquet volume to area times density by linear regression, and choosing briquet dimensions for a selected briquet shape which provides said volume to area ratio for a selected briquet density.

4,496,367

PUMPABLE AQUEOUS SLURRY OF A SOLID FUEL AND A PROCESS FOR THE PRODUCTION THEREOF

Mait M. Mathiesen, Arild; Lars I. Gillberg, Lund; Karl M. E. Hellsten, Ödsmål, and Gunvor B. T. Karlsson, Stenungsund, all of Sweden, assignors to AB Carbogel, Helsingborg and Berol Kemi AB, Stenungsund, both of, Sweden

Filed May 6, 1983, Ser. No. 492,195
Claims priority, application Sweden, May 7, 1982, 8202878
Int. Cl.[3] C10L *1/32*
U.S. Cl. 44—51 9 Claims

1. A pumpable aqueous slurry of a solid fuel in the form of a pulverized, carbonaceous material, characterized in that the aqueous slurry consists essentially of up to about forty percent by weight, based upon the total weight of the aqueous slurry, of coarse grains of the carbonaceous material having a particle size of at least about 1 mm up to 25 mm, said grains being suspended in a carrier liquid having a solids content of 65–90% by weight and consisting essentially of water, pulverized carbonaceous material with a particle size of at most about 0.5 mm, and 0.02–2% by weight of at least one additive which incorporates a water-soluble, surface active compound which is an alkylene oxide adduct having a hydrophobic part and a hydrophilic part, said hydrophilic part consisting essentially of at least one polyalkylene oxide chain having a length of 40–200 alkylene oxide units.

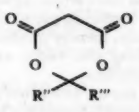
4,496,368

ISOPROPYLIDENE MALONATE-N-ALKYL ALKYLENEDIAMINE CONDENSATION PRODUCTS

Benjamin J. Kaufman, Wappingers Falls, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 17, 1983, Ser. No. 505,511
Int. Cl.[3] C10L *1/18*
U.S. Cl. 44—63 2 Claims

1. A fuel comprising a major amount of a mixture of hydrocarbons boiling in the gasoline boiling range and a minor detergent and corrosion-inhibiting amount of the condensation product of a compound represented by the formula:

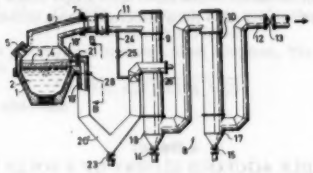


wherein R'' and R''' are hydrogen or C_1–C_5 alkyl groups and an N-alkyl-1,3-propanediamine in which the alkyl radical has from 6 to 18 carbon atoms.

4,496,369
APPARATUS FOR GASIFICATION OF CARBON

Björn Törneman, Västerås, Sweden, assignor to IPS Interproject Service AB, Stockholm, Sweden

Filed Jun. 20, 1983, Ser. No. 505,985
Claims priority, application Sweden, Jul. 1, 1982, 8204089
Int. Cl.³ C10J 3/68; C21C 5/40
U.S. Cl. 48—92 4 Claims



1. Apparatus for gasification of carbon in the form of carbon, hydrocarbons, or hydrocarbon compounds, under total pressure exceeding atmospheric pressure, comprising:

A. reactor means for containing molten iron, said reactor including injection means for injecting carbon, oxygen gas, and iron oxides beneath the surface of the molten iron, and for injection of carbon in stoichiometric excess relative to the amount of oxygen contained in the molten iron in the form of oxide compounds;

B. an exhaust pipe connected to said reactor means for discharge of exhaust gas therefrom;

C. cooling means for cooling said gas connected to said exhaust pipe to form a sealed unit with said reactor means;

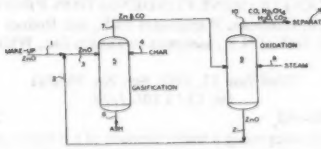
D. valve means for regulating and maintaining pressure greater than atmospheric pressure in said unit, said valve means being positioned on said cooling means;

E. first tapping means for discharge of slag from said reactor means, and second tapping means for discharge of crude iron from said reactor means, each of said first and second tapping means connected to said exhaust pipe by a pressure equalizing pipe, in order to maintain said first and second tapping means at the same pressure as said unit.

4,496,370
ZINC OXIDE-CHAR GASIFICATION PROCESS

William G. Billings, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 4, 1983, Ser. No. 481,956
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R 18 Claims



1. A process for the gasification of solid carbon-containing materials which comprises:

(a) heating under reaction conditions said carbon-containing material as finely divided carbon-containing particles with finely divided particulate zinc oxide, thereby producing a first hot gaseous stream comprising zinc vapor, carbon monoxide, and traces of carbon dioxide,

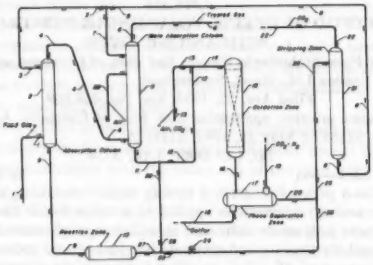
(b) contacting said first hot gaseous stream with a first steam in a separate zone in the absence of solid carbon containing material at a temperature in the range of about 700° C. to 1300° C., thereby converting said zinc to solid zinc oxide, and producing a second hot gas stream comprising carbon monoxide, hydrogen, methane, water, and carbon dioxide, separating said solid zinc oxide from the second hot gas stream, and

(c) recycling said zinc oxide to said step (a).

4,496,371
PROCESS FOR REMOVAL OF HYDROGEN SULFIDE AND CARBON DIOXIDE FROM GAS STREAMS

Peter Urban, Northbrook, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 21, 1983, Ser. No. 534,227
Int. Cl.³ C10J 00/00; C10K 1/12
U.S. Cl. 48—197 R 20 Claims



11. A gas treating process which comprises the steps of:

(a) contacting a feed gas stream which comprises a normally vaporous hydrocarbon, hydrogen sulfide, and carbon dioxide with a first liquid stream which comprises a lean aqueous carbonate solution containing thiosulfate ions in a first absorption zone operated under conditions which promote the selective removal of hydrogen sulfide from the feed gas stream and thereby producing a first vapor stream, which comprises the normally vaporous hydrocarbon, hydrogen sulfide, and carbon dioxide, and a second liquid stream comprising the aqueous carbonate solution and which is rich in hydrogen sulfide;

(b) contacting the first vapor stream with a third liquid stream which comprises a lean aqueous carbonate solution in a second absorption zone operated under conditions which effect the removal of hydrogen sulfide and carbon dioxide from the first vapor stream and thereby producing a treated gas stream, which is withdrawn from the process, and a fourth liquid stream comprising the aqueous carbonate solution and which is rich in hydrogen sulfide and carbon di- oxide;

(c) passing the second liquid stream through a reaction zone in which a reaction between hydrogen sulfide and a thiosulfate is catalytically promoted at conditions which result in the formation of sulfur;

(d) contacting at least major portions of the second liquid stream and the fourth liquid stream with an oxygen-containing gas stream in an oxidation zone in the presence of an oxidation catalyst under conditions which promote the oxidation of hydrogen sulfide to sulfur, including a temperature at which sulfur is present as a liquid, and effecting the production of a mixed phase stream comprising liquid sulfur, the aqueous carbonate solution and residual compounds present in the oxygen-containing gas stream;

(e) separating the mixed phase stream in a phase separation zone and thereby producing an effluent gas stream, a liquid phase sulfur stream which is withdrawn from the process, and a fifth liquid stream comprising the aqueous carbonate solution and which is rich in carbon dioxide; and,

(f) releasing carbon dioxide from the fifth liquid stream in a stripping zone operated at stripping conditions and thereby producing a second vapor stream, which comprises carbon dioxide, and is withdrawn from the process,

and a sixth liquid stream comprising an aqueous carbonate solution comprising thiosulfate ions which is lean in both hydrogen sulfide and carbon dioxide, and recycling at least a portion of the sixth liquid stream to the first and the second absorption zones as the first and the third liquid streams.

4,496,372

ABRASIVE BODIES

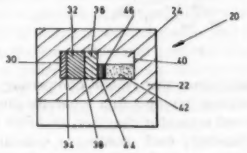
Eric A. Almond, 34 Weston Ave., West Molesey, Surrey, England (KT8 9RG), and Mark G. Gee, 20, Morland Close, Hampton, Teddington, Middlesex, England

Filed Mar. 30, 1983, Ser. No. 480,485

Claims priority, application United Kingdom, Mar. 31, 1982, 8209410; Jan. 31, 1983, 8302620

Int. Cl.³ B24D *3/02*

U.S. Cl. 51—309 **17 Claims**



1. A method of bonding an abrasive compact to a metal-containing support body including the steps of:

(a) bonding a layer of nickel, copper, cobalt, iron or an alloy containing one or more of these metals to a surface of the support body;

(b) bringing the compact and support body together so that the metal layer contacts a surface of the compact;

(c) urging the compact and support body together by applying a transverse pressure thereto;

(d) raising the temperature of the metal layer to a temperature below its melting point and in the range of 650° C. to 950° C.; and

(e) maintaining the pressure and temperature for a time sufficient to cause diffusion bonding between the compact and the support body, steps (d) and (e) being carried out in an inert atmosphere.

4,496,373

DIFFUSION MEMBRANE AND PROCESS FOR SEPARATING HYDROGEN FROM GAS MIXTURE

Friedrich Behr, Essen; Rudolf Schulten, Aachen Richterich, and Walter Weirich, Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 446,068, Dec. 2, 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,831

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149084; Dec. 11, 1981, 3149155

Int. Cl.³ B01D *53/22*

U.S. Cl. 55—16 **20 Claims**

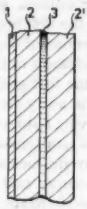
1. Hydrogen diffusion membrane consisting essentially of a metallic material selected from the group consisting of tantalum, niobium, titanium, vanadium, nickel and alloys and mixtures of two or more of the foregoing, which material is nonporous but selectively permeable for hydrogen, having a palladium alloy coating on the hydrogen entry side and having the improvement wherein:

said palladium alloy coating is of an alloy of palladium and an alloy partner metal selected from the group consisting of copper, silver and yttrium with a content of at least 45 atomic % copper or at least 50 atomic % silver or at least 7 atomic % yttrium, and

said material of said membrane itself has a content of the same alloy partner metal as in said palladium alloy which is in a concentration at least sufficient for equilibrium with the palladium alloy.

14. Method for the separation of hydrogen from gas mixtures by diffusion at elevated temperature through a membrane of a metallic material having a coating of a palladium alloy on the hydrogen entry side, said method comprising the steps of:

utilizing a membrane in which said palladium alloy coating is an alloy of palladium and an alloy partner metal selected from the group consisting of copper, silver and yttrium with a content of at least 45 atomic % copper, or at least 50 atomic % silver, or at least 7 atomic % yttrium, while the metallic material of the membrane itself has a content



of the same alloy partner metal as in said palladium alloy which is in a concentration at least sufficient for equilibrium with the palladium alloy;

causing the hydrogen, after passing through a layer of the metallic material of said membrane, to come into contact with a melt containing a substance selected from the group consisting of alkali metals, alkaline earth metals and mixtures of alkali and alkaline earth metals having an affinity for hydrogen which is higher than that of the metallic material of said membrane and of that of the hydrogen bonding in said gas mixture and which is capable of forming a hydride either in solution in said melt or as a suspension therein.

4,496,374

COMPOUND AND PROCESS FOR DENATURING HIGH SOLIDS PAINTS

Donald P. Murphy, Madison Heights, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Filed Feb. 23, 1983, Ser. No. 467,282

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—84 **7 Claims**

1. A process for denaturing captured high-solids paint particles entrained in an aqueous wash solution of a gas scrubbing device comprising the steps of contacting paint overspray particles entrained in a gas stream with an aqueous wash solution consisting essentially of water and a dispersion of substantially wash solution insoluble talc particles predominantly of a particle size of less than about 15 microns present in an amount effective for coagulating the captured high-solids paint particles and effecting a denaturing thereof.

4,496,375

AN ELECTROSTATIC AIR CLEANING DEVICE HAVING IONIZATION APPARATUS WHICH CAUSES THE AIR TO FLOW THERETHROUGH

Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356

Continuation of Ser. No. 282,420, Jul. 13, 1981, abandoned. This application Jun. 14, 1983, Ser. No. 504,273

Int. Cl.³ B03C *3/12, 3/82*

U.S. Cl. 55—131 **14 Claims**

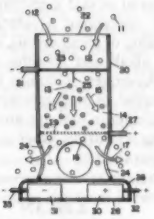
1. A device for pumping air and collecting airborne particulates by electrostatic techniques comprising:

a case means, tubular in shape and constructed of electrically non-conductive material, for supporting the components of the device and for providing a channel for the convec-

tion of air through the device, having a first opening for the admittance of air and having a second opening for the exit of air, between the openings and within the case means are the following:

a first grid means located near the first opening and positioned in a plane orthagonal to the axis of the case means occupying the entire plane extending to the internal surface of the wall of the case means, said first grid means formed of metal wire of circular cross section, said first grid means is connected to a negative high voltage source, said first grid means is constructed and arranged so as to provide a defined negative field across the convection channel within the case means to repel negatively charged molecules and particulates, generated within the case means, away from the first opening and causing them to flow toward the interior of the case means;

an electrode means, adjacent to the first grid means located near the center of the first grid means and on the side of the first grid means away from the first opening, said electrode means having a sharp point facing in a direction away from the first grid means and toward the second opening, said electrode means is connected to a high voltage negative source, said electrode means is constructed and arranged in relation to the first grid means so that the negatively charged field produced by the first



grid means encompasses the electrode means and in combination with the negative potential produced by the electrode means acts to generate a high charge density at its sharp point sufficient to transfer a negative electric charge to atmospheric molecules and particulates adjacent thereto;

a second grid means spaced apart from the electrode means toward the second opening, said second grid means positioned in a plane orthogonal to the axis of the case means and occupying the entire plane extending to the internal surface of the wall of the case means, said second grid means formed of metal wire of circular cross section, providing a tortuous pathway while maintaining minimal impedance to the flow of air through the case means, said second grid means is connected to a positive high voltage source, said second grid means is constructed and arranged so as to attract negatively charged molecules and particulates away from the electrode means causing the molecules and particulates to flow through the case means in a direction toward the second opening of the case means and also serving to provide surface area to which negatively charged particulates will adhere and to which negatively charged molecules will give up their negative charge and flow through;

said negative high voltage source and said positive high voltage source are mounted externally of said case means.

4,496,376

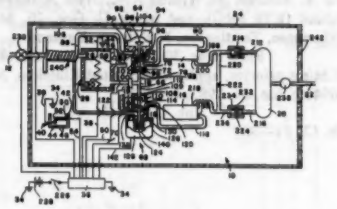
VARIABLE AREA MOLECULAR SIEVE CONTAINER HAVING A THERMAL CONTROL SYSTEM

Richard W. Hradek, Davenport, Iowa, assignor to Litton Systems, Inc., Davenport, Iowa

Division of Ser. No. 872,694, Jan. 26, 1978, abandoned. This application Nov. 2, 1981, Ser. No. 317,101

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—163 **9 Claims**



1. A material separator system comprising:

a first container having a first separator chamber connected to a second separator chamber, said first and second separator chambers each holding a quantity of adsorption material in particle form to create a first bed, said first and second chambers each having a cross-sectional area that varies linearly with distance to compensate for changes in the flow of the fluid from the first chamber to the second chamber caused by retention of a component in the fluid mixture by the particles contained in the first bed;

a second container having a third separator chamber connected to a fourth separator chamber, said third and fourth separator chambers each holding a quantity of adsorption material in particle form to create a second bed, said third and fourth chambers each having a cross sectional area that varies linearly with distance to compensate for changes in the flow of fluid from the third chamber to the fourth chamber caused by retention of a component in the fluid mixture by the particles contained in the second bed;

supply conduit means for connecting a source of pressurized fluid mixture to said first and third chambers;

an outlet conduit having a first branch connected to said second chamber and a storage container, and a second branch connected to said fourth chamber and the storage chamber;

an intermediate conduit for connecting said first branch to said second branch;

a restrictive member located in said intermediate conduit to limit the flow communication between the first and second branches;

valve means connected to said supply conduit for sequentially controlling the communication of said source of fluid mixture to one of said first and second containers where an element in the fluid mixture is adsorbed in the particles to produce a product fluid as the fluid mixture flows from the first chamber toward the second chamber and from the third chamber toward the fourth chamber, respectively, said varying of the cross sectional area providing substantially uniform adsorption throughout the entire first and second beds as the fluid mixture flows therethrough, said product fluid flow through the outlet conduit while a portion thereof flows through the intermediate conduit to purge the element from the particles in the other of said first and second containers by flowing from the second chamber toward the first chamber and the fourth chamber toward the third chamber, respectively;

heater means associated with said supply conduit means for maintaining said pressurized fluid mixture within a predetermined temperature range;

shroud means for insulating at least said heater means, supply conduit, said valve means, and said first and second containers from the surrounding environment;

first sensor means connected to said heater means for monitoring the temperature of said pressurized fluid mixture in said supply conduit to establish a first operational temperature signal;

second sensor means located in said shroud for measuring the temperature therein to establish a second operational temperature signal;

bleed valve means connected to said supply conduit; and

electronic control means for supplying said first and second valve means with an operational signal to sequentially transfer the supply of fluid mixture from the first container to the second container after a predetermined time period, said electronic control means being connected to said first and second sensor means for supplying said heater means with a first operational input in response to said first temperature signal below a predetermined value and for supplying said bleed valve means with a second operational input to allow a portion of the fluid mixture in said supply conduit to flow into the shroud means and maintain the temperature therein within said predetermined temperature range in order that optimum adsorption of the element occurs in the first and second containers with the presentation of the fluid mixture thereto.

4,496,377

BAG FILTER APPARATUS

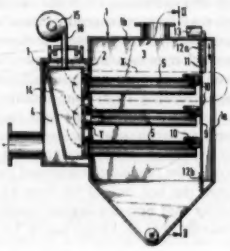
Adolf Margraf, Am Schleplingsbach 46, 3060 Stadthagen, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 473,003

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 8206750[U]

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—287 **3 Claims**



1. In a bag filter apparatus comprising, a housing having at least one filter chamber which is sub-divided into a clean gas room having a clean gas outlet, and a dust gas room having a dust gas inlet, by a partition wall provided with perforations, a plurality of horizontal and cross-sectionally flattened oval filter bags arranged in vertical and parallel rows, and received in the dust gas room between a rear wall of the housing and the partition wall, to be impinged upon by dust gas from the outside toward the inside thereof, each of said filter bags being provided with a rigid internal spacing element, and being supported at the closed extremity thereof in the dust gas room, and having the open extremity thereof releasably fastened to the partition wall, and a sealing frame having rigid parts disposed at the clear gas side of the partition wall releasably and sealingly fastening the open extremities of said filter bags to the partition wall in alignment with the perforations of the partition wall, the improvement which comprises the spacing element of each of said filter bags terminates before the partition wall, and is loosely supported thereat by the rigid parts of said sealing frame, at least one vertical spring-borne auxiliary wall extending freely and parallel to the rear wall of the housing for supporting said filter bags at the closed extremity thereof, and an intermittently operable oscillation generator coupled to said at least one auxiliary wall for oscillating the same, said filter bags being releasably connected at the closed extremity thereof to said at least one auxiliary wall.

4,496,378

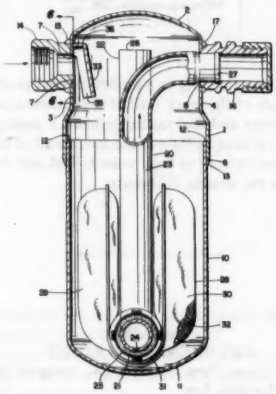
ACCUMULATOR DEHYDRATOR

Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.

Filed Dec. 16, 1982, Ser. No. 432,257

Int. Cl.³ B01D *50/00;* **F25B** *43/00*

U.S. Cl. 55—316 **6 Claims**



1. An accumulator dehydrator comprising:

a casing having an inlet opening and an outlet opening,

a dessicant container in said casing,

deflector means in said casing having a body in close proximity to said inlet opening for engagement by refrigerant entering said casing through said inlet opening,

said deflector means comprising an arcuate flange,

an inlet fitting having a portion extending into said inlet opening,

said arcuate flange extending into said opening, and

means for securing said portion of said fitting and said arcuate flange in said opening in said casing.

4,496,379

CANISTER FOR VOLATILE FUEL CONTROLLING DEVICE

Tadashi Kozawa, Aichi, Japan, assignor to Aisan Industry Co., Ltd., Aichi, Japan

Division of Ser. No. 337,651, Jan. 7, 1982, Pat. No. 4,448,594. This application Feb. 29, 1984, Ser. No. 584,838

Claims priority, application Japan, Jan. 27, 1981, 56-10580[U]

Int. Cl.³ B01D *39/00*

U.S. Cl. 55—387 **6 Claims**

1. A lateral type canister for a volatile fuel controlling device comprising

a laterally oriented canister case having a rectangular cross-section,

a single volatile fuel inlet and a volatile fuel outlet at one lateral end of said canister case,

said canister case containing a volatile fuel adsorbent,

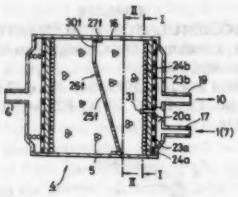
a separation plate divides the adsorbent into two parts between said fuel inlet and said fuel outlet,

an air introduction port disposed at another end of said canister case for introduction of scavenging air into said canister case,

a plate-like baffle disposed inside said canister in an adsorbent layer of said volatile fuel adsorbent,

retainer means for securing said plate-like baffle to the inner wall of the canister case, and

said baffle is inclined with respect to said canister case and



has an edge extending to a predetermined position spaced from a side of the inner wall of said canister case beyond the fuel inlet and fuel outlet defining a passage between said edge of said baffle and the inner wall of said canister case for movement of both volatile fuel and the scavenging air to the volatile fuel outlet.

4,496,380

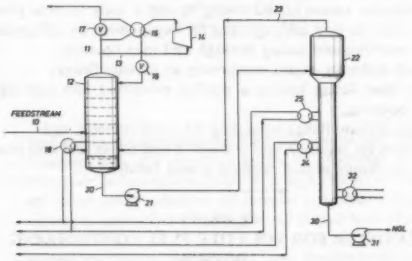
CRYOGENIC GAS PLANT

John M. Harryman, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 324,361, Nov. 24, 1981, abandoned. This application Jul. 7, 1983, Ser. No. 511,448

Int. Cl.³ F25J 3/02

U.S. Cl. 62—24 **8 Claims**



1. A process for separating ethane and heavier components from a natural gas stream utilizing a cryogenic plant having a cold feedstream, said process comprising:

retrofitting said process to include a rectifier section upstream of a demethanizer;

introducing the cold feedstream into the rectifier section to recover ethane from the feedstream stream and withdrawing the methane through the overhead stream;

passing 1 to 17 percent of the overhead stream back to the top of said rectifier as a reflux stream, the pressure of said reflux stream being increased above the pressure of said overhead stream and then condensed;

directly introducing the bottoms of said rectifier as the feed to a demethanizer column;

directly returning the top stream of said demethanizer as a bottom feed to said rectifier;

withdrawing substantially all of said ethane and heavier components from the bottom of said demethanizer.

4,496,381

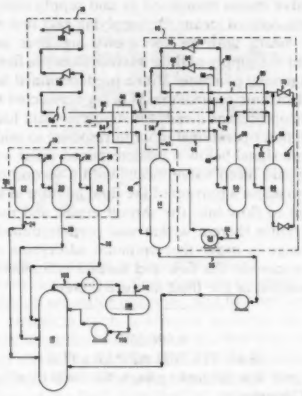
APPARATUS AND METHOD FOR RECOVERING LIGHT HYDROCARBONS FROM HYDROGEN CONTAINING GASES

Johannes Norenburg, Marblehead, Mass., assignor to Stone & Webster Engineering Corp., Boston, Mass.

Filed Feb. 1, 1983, Ser. No. 462,982

Int. Cl.³ F25J 3/02

U.S. Cl. 62—30 **18 Claims**



1. An apparatus comprising: elements designed, dimensioned and arranged for recovering ethylene from a cracked gas containing ethylene, methane and hydrogen, said apparatus including,

(a) a rectifier tower through which the cracked gas passes;

(b) an overhead line extending from the rectifier tower;

(c) a refrigeration system in communication with the rectifier tower, said refrigeration system comprising:

indirection heat exchange means in communication with said rectifier tower for cooling and partially condensing an overhead vapor passing from said rectifier tower overhead line through the hot side of said indirect heat exchange means; an expansion means in communication with said heat exchange means for expanding the non-condensed portion of the partially condensed overhead vapor discharged from the hot side of the heat exchange means and recirculating said non-condensed portion to the cold side of said indirect heat exchange means for refrigeration; and

(d) a reflux means in communication with the hot side of said indirect heat exchange means and said rectifier tower for directing the condensed portion of the partially condensed rectifier tower overhead vapor from the hot side of the heat exchange means to the rectifier tower for reflux, thereby producing an ethylene rich bottoms product from said rectifier tower.

8. A method for recovering ethylene from a cracked gas comprised of ethylene, methane and hydrogen comprising the steps of:

(a) directing a stream of the cracked gas to a rectifier tower;

(b) removing an overhead vapor from said rectifier tower;

(c) directing the overhead vapor from said rectifier tower through the hot side of an indirect heat exchanger;

(d) cooling and partially condensing said overhead vapor in the hot side of said heat exchanger;

(e) expanding and recirculating the non-condensed portion of the overhead vapor to the cold side of the indirect heat exchanger;

(f) refluxing the rectifier tower with the condensed portion of the overhead vapor; and

(g) recovering ethylene as a bottoms product from said rectifier tower.

4,496,382

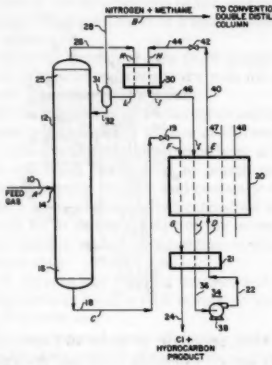
PROCESS USING SERPENTINE HEAT EXCHANGE RELATIONSHIP FOR CONDENSING SUBSTANTIALLY SINGLE COMPONENT GAS STREAMS

Jacob M. Geist, Allentown; Harvey L. Vines, Emmaus; Miguel R. Alvarez, Allentown; Howard C. Rowles, Center Valley, and Donald W. Woodward, New Tripoli, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 21, 1983, Ser. No. 477,200

Int. Cl.³ F25J 1/02

U.S. Cl. 62—31 12 Claims



5. In a cryogenic nitrogen rejection process for a natural gas feed stream containing nitrogen, mathane and ethane-plus hydrocarbons which comprises cryogenically separating the natural gas stream into at least one hydrocarbon stream and a nitrogen stream and providing refrigeration for the process by means of a methane heat pump cycle which comprises compressing a methane stream, cooling the compressed methane stream through a heat exchange relationship with a vaporizing multicomponent hydrocarbon stream to essentially totally condense the methane stream, expanding the condensed methane stream and warming the expanded methane stream to provide refrigeration, the method for treating a natural gas stream containing a variable composition, which method comprises precluding condensed phase backmixing of the compressed methane stream and pot boiling of the vaporizing multicomponent hydrocarbon coolant stream by passing the compressed methane stream through a serpentine pathway containing a series of horizontal passes in a cold-end up heat exchange relationship with the vaporizing multicomponent hydrocarbon stream.

10. In a nitrogen rejection unit comprising a fractional distillation column for separating a natural gas feed stream into a multicomponent hydrocarbon bottoms stream and a nitrogen and methane overhead stream, a double distillation column which comprises a high pressure distillation zone and a low pressure distillation zone for separating the overhead stream from the fractional distillation column into a nitrogen stream and a methane stream, and a methane heat pump cycle for providing refrigeration for the nitrogen rejection unit, which methane cycle includes means for cooling the compressed methane recycle stream through a heat exchange relationship with the multicomponent hydrocarbon stream, the improvement which comprises means designed, sized and arranged for precluding condensed phase backmixing of the compressed methane stream and pot boiling of the vaporizing multicomponent hydrocarbon stream comprising a cold-end up heat exchanger having a serpentine pathway containing a series of horizontal passes for cooling and condensing the methane recycle stream of the methane heat pump cycle in an overall upward flow against the multicomponent hydrocarbon stream.

4,496,383

PRODUCTION OF NITROGEN FROM AIR

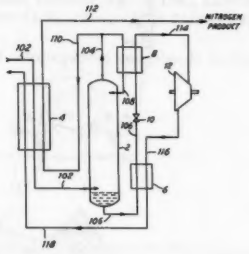
Colin Hubbard, Manchester; David I. Limb, and Melvyn Duckett, both of Cheshire, all of England, assignors to Petrocarbon Developments Limited, Manchester, England

Filed May 3, 1983, Ser. No. 491,024

Claims priority, application United Kingdom, May 11, 1982, 82/13605

Int. Cl.³ F25J 3/02, 3/04

U.S. Cl. 62—31 3 Claims



1. A method for the recovery of nitrogen from air by cryogenic separation, comprising the steps of

(i) cooling and distilling compressed air, from which components such as moisture and carbon dioxide which would solidify at the temperatures employed for the separation have been removed, in a single column to produce a nitrogen-rich stream overhead and an oxygen rich liquid at the bottom;

(ii) expanding said oxygen-rich liquid from the bottom to an intermediate pressure;

(iii) condensing a first portion of the overhead stream by indirect heat exchange in a reflux condenser with said intermediately expanded oxygen-rich liquid from the bottom of the column, thereby evaporating said oxygen-rich liquid and providing reflux for said distillation;

(iv) work expanding said evaporated oxygen-rich liquid from said reflux condenser, either directly after recovery from said reflux condenser or indirectly after first subcooling the oxygen-rich liquid recovered from the bottom of the column prior to step (ii), by indirect heat exchange with the evaporated-oxygen rich liquid obtained from said reflux condenser prior to said work-expansion, said evaporated oxygen-rich liquid entering said work-expanding step at an initial temperature not substantially greater than at which it was recovered from said reflux condenser, or if said evaporated-oxygen rich liquid obtained from said reflux condenser has been first passed through said subcooler, at an initial temperature not substantially greater than at which it was recovered from the subcooler;

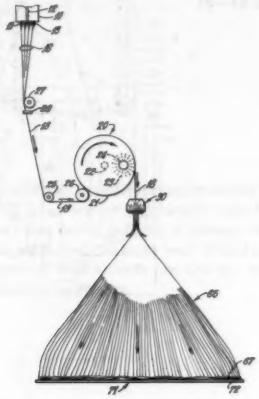
(v) subcooling the oxygen-rich liquid recovered from the bottom of the column prior to step (ii) by indirect heat exchange in a sub-cooler with work-expanded evaporated oxygen-rich liquid from step (iv), said work-expanded evaporated oxygen-rich liquid entering said cooler at temperature not substantially greater than that to which it has been lowered by work expansion;

(vi) cooling the compressed air feed to the distillation column by indirect heat exchange with a second portion of the overhead stream from the distillation and work-expanded oxygen recovered from the subcooler in step (v).

4,496,384
METHOD AND APPARATUS FOR PRODUCING A CONTINUOUS GLASS FILAMENT MAT

David C. K. Lin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 11, 1983, Ser. No. 522,883
Int. Cl.³ C03B 37/06
U.S. Cl. 65—4.4 12 Claims



1. Apparatus for producing a mat of continuous glass filaments comprising:

(a) feeder means for supplying a plurality of streams of molten glass;

(b) pull roll means for drawing streams into said filaments;

(c) means for orienting said filaments as a planar band;

(d) a collection surface for collecting said filaments as said mat; and

(e) distribution means for receiving said band from the pull roll means comprising:

a first blower means adapted to supply a stream of gas;

a second blower means adapted to supply a stream of gas, said second blower means being spaced from said first blower means, said filaments advancing from said pull roll means between said first and second blower means;

a first control surface terminating in a tapered, receding arcuate section, said first control surface being associated with said first blower means; and

a second control surface terminating in a tapered, receding arcuate section, said second control surface being associated with said second blower means, said tapered, receding arcuate sections being diagonally opposed to direct said gaseous streams to orient said advancing filaments as a diverging planar array for collection as said mat.

4,496,385
APPARATUS FOR PRODUCING A CONTINUOUS GLASS FILAMENT MAT

David C. K. Lin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 4, 1983, Ser. No. 520,091
Int. Cl.³ C03B 37/06
U.S. Cl. 65—9 6 Claims

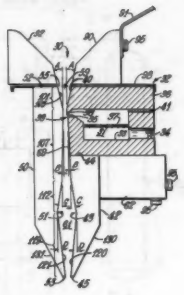
1. Apparatus for producing a mat of continuous glass filaments comprising:

feeder means for supplying a plurality of streams of molten glass;

pull roll means for drawing streams into said filaments, said pull roll having an axis of rotation;

a collection surface for collecting said filaments as said mat;

distribution means having (a) an inlet adapted to receive said plurality of filaments arranged as a substantially planar band, said inlet being oriented substantially parallel to the axis of rotation of the pull roll, (b) a blower section adapted to supply a substantially planar high velocity gaseous stream to contact said filaments, (c) a first control surface extending from said blower section, and (d) a second control surface opposite said first control surface, said first and second control surfaces and said blower section forming (a) a throat section to receive said planar gaseous stream from said blower section; (b) a pre-outlet divergent section extending from said throat section, said divergent section having an angle of divergence within



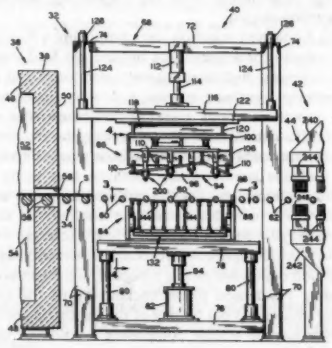
the range from about 10° to about 40°; and (c) a convergent outlet section extending from said diverging section to (i) reduce the velocity of the gaseous stream and advancing filaments and (ii) impart lateral movement to some of the gaseous streams and filaments to advance said filaments as a diverging planar array having a width at said collection surface at least about 4 times the width of the band of filaments entering said inlet; and

means for moving said distribution means to deposit the array filaments discharged from distribution means across the width of the mat being formed.

4,496,386
METHOD OF AND APPARATUS FOR BENDING GLASS SHEETS

Frank J. Hymore, Oregon, Ohio, and Paul H. Kreinbrink, Temperance, Mich., assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Jan. 16, 1984, Ser. No. 570,792
Int. Cl.³ C03B 23/023
U.S. Cl. 65—106 12 Claims



1. A method of bending a glass sheet comprising the steps of:

heating a glass sheet to the softening point thereof;

conveying the heated glass sheet on a series of spaced apart

conveyor rolls along a path positoned in spaced relation to a press member including a shaping rail corresponding to the marginal outline of the heated glass sheet, and having interruptions therein to permit passage of the press member upwardly through the conveyor rolls, and an array of shaping rail extensions adapted to substantially fill at least a portion of the interruptions of the shaping rail;

moving the shaping rail of the press member along a path generally normall to and through the conveyor rolls; and

moving the array of shaping rail extensions relative to the interruptions of the shaping rail to substantially fill at least a portion of the interruptions of the shaping rail to effect a bending of the glass sheet to impart a final desired shape to the glass sheet.

4. Apparatus for bending a glass sheet comprising:

a plurality of spaced apart conveyor rolls for moving a heat softened glass sheet along a path;

a movable bending member including an outline shaping rail provided with a shaping surface conforming to the marginal outline of the glass sheet to be bent, at least a portion of the rail being interrupted to permit passage of said member upwardly through said conveyor rolls;

an auxiliary array of shaping rail extensions adapted to substantially fill at least a portion of the interruptions of the outline shaping rail of said bending member above said conveyor rolls;

means for moving said bending member and the associated shaping surfaces along a path normal to and through said conveyor rolls; and

means for moving said array of shaping rail extensions relative to the interruptions of the outline shaping rail to effect the desired bending of the glass sheet.

4,496,387

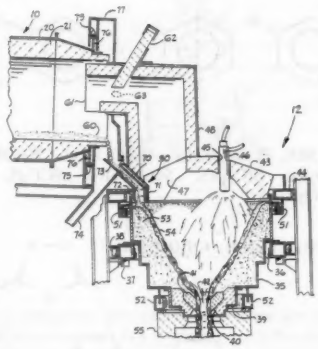
TRANSITION BETWEEN BATCH PREHEATING AND LIQUEFYING STAGES APPARATUS

Robert B. Heithoff, LaVale; John K. Groetzinger, Cumberland, both of Md., and Ronald L. Schwenninger, Ridgeley, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 31, 1983, Ser. No. 547,169

Int. Cl.³ C03B *5/10*

U.S. Cl. 65—335 **9 Claims**



1. Apparatus for liquefying batch materials comprising: rotary kiln means for preheating batch materials comprised of an elongated cylindrical vessel mounted for rotation about its cylindrical axis, batch feeding means for feeding batch to a first end of the rotary kiln, a batch liquefying vessel adjacent to the opposite end of the rotary kiln and including combustion means for heating batch materials to a liquefying temperature, batch transfer means for collecting preheated batch being discharged from the rotary kiln and for directing the batch into the liquefying vessel, duct means for directing exhaust gas from the liquefying vessel, a portion of the duct means extending into the interior of the rotary kiln at a location adjacent to and spaced above the location of batch discharge from the rotary kiln.

4,496,388

TRIAZOLYLALKANETRIOL DERIVATIVES

John M. Clough, Buckinghamshire, England, assignor to Imperial Chemical Industries PLC, London, England

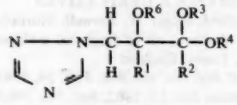
Filed Jul. 27, 1982, Ser. No. 402,796

Claims priority, application United Kingdom, Aug. 19, 1981, 8125378; Feb. 9, 1982, 8203708; Apr. 1, 1982, 8209705

Int. Cl.³ A01N *43/50, 43/64;* **C07D** *233/60, 249/08*

U.S. Cl. 71—76 **6 Claims**

1. A compound selected from compounds having the formula (I):



(I)

and stereoisomers thereof, wherein R^1 is alkyl having from 1 to 6 carbon atoms, or phenyl substituted with halogen atoms or alkyl of 1 to 6 carbons; R^2 is hydrogen, alkyl having from 1 to 6 carbon atoms or phenyl; R^3 and R^4, which may be the same or different, are alkyl or alkenyl each having up to 6 carbon atoms, or together form an alkylene bridging group containing from 1 to 3 carbon atoms between the two oxygen atoms and which may be optionally substituted with methyl groups; R^6 is hydrogen or alkyl having from 1 to 6 carbon atoms and acid salts and metal complexes thereof.

4. A fungicidal, or plant growth regulating composition comprising an effective amount of a compound of general formula (I) as defined in claim 1, and a carrier or diluent.

4,496,389

AMIDE DERIVATIVES OF N-TRIFLUOROACETYL-N-PHOSPHONOMETHYLGLYCINE, HERBICIDAL COMPOSITIONS AND USE

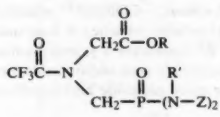
John E. Franz, Crestwood, and Robert J. Kaufman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 441,480, Nov. 15, 1982, abandoned, which is a continuation of Ser. No. 922,923, Jul. 10, 1978, Pat. No. 4,359,332. This application May 11, 1984, Ser. No. 609,263

Int. Cl.³ A61K *57/28;* **C07F** *9/36*

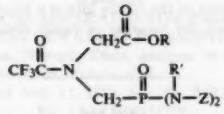
U.S. Cl. 71—86 **15 Claims**

1. A compound of the formula



wherein R is an alkyl group of from 1 to 10 carbon atoms, a chloro lower alkyl group, a lower alkoxy lower alkyl group containing from 3 to 6 carbon atoms or a lower alkoxy lower alkoxy lower alkyl group containing from 5 to 9 carbon atoms, R' is hydrogen, lower alkyl, lower alkenyl or lower alkynyl, Z is a member of the class consisting of alkyl of from 1 to 6 carbon atoms, alkenyl of from 2 to 6 carbon atoms, alkynyl of from 3 to 6 carbon atoms, cycloalkyl containing from 3 to 7 carbon atoms.

6. A herbicidal composition comprising an inert adjuvant and a compound of the formula



wherein R is an alkyl group of from 1 to 10 carbon atoms, a chloro lower alkyl group, a lower alkoxy lower alkyl group containing from 3 to 6 carbon atoms or a lower alkoxy lower alkoxy lower alkyl group containing from 5 to 9 carbon atoms, R′ is hydrogen, lower alkyl, lower alkenyl or lower alkynyl, Z is a member of the class consisting of alkyl of from 1 to 6 carbon atoms, alkenyl of from 2 to 6 carbon atoms, alkynyl of from 3 to 6 carbon atoms, cycloalkyl containing from 3 to 7 carbon atoms.

4,496,390

N-PHENYLPYRAZOLE DERIVATIVES

Leslie R. Hatton, Chelmsford; Edgar W. Parnell, Hornchurch, and David A. Roberts, Bedford, all of England, assignors to May & Baker Limited, Essex, England

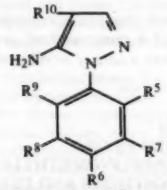
Continuation-in-part of Ser. No. 237,661, Feb. 24, 1981, abandoned. This application Jul. 15, 1982, Ser. No. 398,337

Claims priority, application United Kingdom, Feb. 26, 1980, 806428; Jul. 17, 1981, 8122143; Jul. 17, 1981, 8122142; Feb. 5, 1982, 8203371; Feb. 5, 1982, 8203369

Int. Cl.³ A01N *43/56*

U.S. Cl. 71—92 **30 Claims**

1. A method of controlling the growth of weeds at a locus which comprises applying to the locus a herbicidally effective amount of an N-phenylpyrazole derivative in a herbicidal composition which comprises, as active ingredient, an effective amount of an N-phenylpyrazole derivative of the formula:



(wherein each of R^5 and R^6 represents an alkyl or alkoxy radical of 1 through 4 carbon atoms, a trifluoromethyl, trifluoromethoxy, nitro, cyano or primary amino radical or a fluorine, chlorine or bomine atom, each of R^7, R^8 and R^9 represents a hydrogen atom, an alkyl or alkoxy radical of 1 through 4 carbon atoms, a trifluoromethyl, trifluoromethoxy, nitro, cyano or primary amino radical or a fluorine, chlorine or bromine atom, or R^5, R^7, R^8 and R^9 each represents a hydrogen atom and R^6 represents a trifluoromethoxy or trifluoromethyl radical and R^{10} represents a cyano radical or substituted carbamoyl radical —$CONHR^{11}$, wherein R^{11} represents a methyl or ethyl radical), or when at least one of symbols R^5, R^6, R^7, R^8 and R^9 represents a primary amino radical or an agriculturally acceptable acid addition salt thereof, in association with one or more capatible herbicidally-acceptable diluents or carriers.

4,496,391

HERBICIDES CONTAINING 3-ARYL-5-METHYLPYRAZOLE-4-CARBOXYLIC ACID ESTERS, THEIR MANUFACTURE AND USE

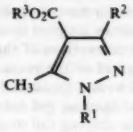
Peter Plath, Ludwigshafen; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 150,751, May 19, 1980, abandoned. This application Jan. 21, 1983, Ser. No. 459,988

Int. Cl.³ A01N *43/56, 43/10*

U.S. Cl. 71—92 **1 Claim**

1. A process for combating the growth of unwanted plants, wherein the plants are treated with a herbicidally effective amount of a pyrazole derivative of the formula



where R^1 denotes hydrogen, R^2 denotes phenyl which is unsubstituted or mono-substituted by fluorine, chlorine, bormine, methyl methoxy, cyano trifluoromethyl, trifluoromethoxy or methoxycarbonyl, R^2 further denotes, an unsubstituted or methyl- or chloro-substituted thienyl, furyl, oxazolyl or pyridyl, or R^2 denotes α-naphthyl or β-naphthyl, and R^3 denotes methyl, or a salt thereof.

4,496,392

HERBICIDAL HETEROCYCLIC ALKYLAMINOCARBONYLSULFONAMIDES

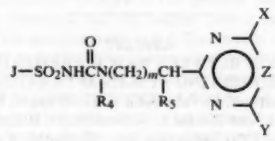
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 377,371, May 12, 1982, abandoned. This application Mar. 14, 1983, Ser. No. 472,879

Int. Cl.³ C07D *251/46, 401/12, 405/04;* **A01N** *43/66*

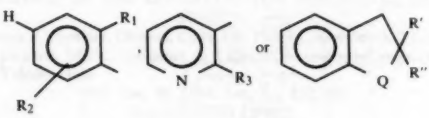
U.S. Cl. 71—93 **19 Claims**

1. A compound of the formula:

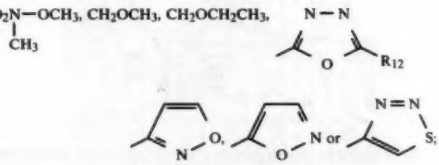


wherein

J is



R_1 is NO_2, F, Cl, Br, CF_3, C_1–C_3 alkyl, $CH_2CH_2OCH_3$, CO_2R_6, $S(O)_nR_7$, $SO_2NR_8R_9$, SCF_2H, OR_{10}, OSO_2R_{11},



R_2 is H, F, Cl, Br, CH_3, OCH_3 or CF_3;

R_3 is Cl, SO_2CH_3 or $SO_2N(CH_3)_2$;

R_4 and R_5 are independently H or CH_3;

R_6 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, CH_2CH_2Cl or $CH_2CH_2OCH_3$;

R_7 is C_1–C_3 alkyl or $CH_2CH{=}CH_2$;

R_8 is CH_3;

R_9 is C_1–C_3 alkyl;

R_{10} is C_1–C_3 alkyl, CF_2H or $CH_2CH_2OCH_3$;

-continued

R_{11} is C_1–C_3 alkyl;
R_{12} is H or CH_3;
n is 0 or 2;
m is 0 or 1; Q is O, S or SO_2;
R′ is H or CH_3;
R″ is H or C_1–C_3 alkyl;
Z is N;
X is CH_3 or OCH_3;
Y is CH_3, C_2H_5, OCH_3, OC_2H_5, CH_2OCH_3, $CH(OCH_3)_2$ or

provided that

(1) R_4 and R_5 cannot simultaneously be CH_3 and when either R_4 or R_5 is CH_3, then R_2 must be H;

and their agriculturally suitable salts.

8. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid inert diluent.

4,496,393

IMMERSION AND VAPORIZATION CHAMBER

Hans Lustenberger, Schaffhausen, Switzerland, assignor to George Fischer Limited, Schaffhausen, Switzerland

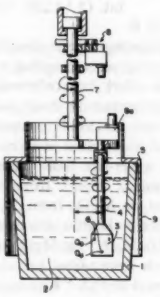
PCT No. PCT/CH82/00065, § 371 Date Jan. 7, 1983, § 102(e) Date Jan. 7, 1983, PCT Pub. No. WO82/03875, PCT Pub. Date Nov. 11, 1982

PCT Filed May 4, 1982, Ser. No. 459,539

Claims priority, application Switzerland, May 8, 1981, 2990/81

Int. Cl.³ C22C *33/10*

U.S. Cl. 75—58 **19 Claims**



19. A process for introducing magnesium into pig iron, cast iron or cast steel melt in a treatment vessel for desulfurization or production of nodular graphite iron, vermicular graphite iron or magnesium treated cast iron, comprising the steps of:

filling a chamber of a capsule with liquid magnesium, the capsule having a vertical wall with an upper portion forming two-thirds of the wall and a lower portion forming one-third of the wall, an outlet opening in the upper portion with a first transverse cross-sectional area and a inlet opening in the lower portion with a second transverse cross-sectional area less than the first transverse cross-sectional area;

solidifying the magnesium; and

submerging the capsule filled with solidified magnesium into the melt in the treatment vessel.

4,496,394

CONTINUOUS METHOD OF REMOVING TIN FROM LEAD

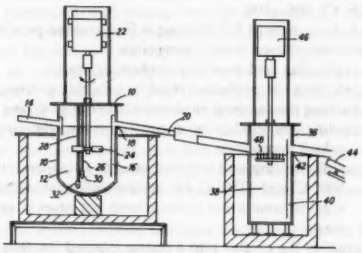
John E. Bowers, Oxford, assignor to BNF Metals Technology Centre, Oxfordshire, England

Filed Jul. 15, 1983, Ser. No. 514,023

Claims priority, application United Kingdom, Jul. 16, 1982, 8220733

Int. Cl.³ C22B *13/06*

U.S. Cl. 75—63 **9 Claims**



1. A continuous method of removing tin from lead, which method comprises maintaining a pool of molten lead in a reaction vessel at a temperature of from 510° to 570° C., continuously introducing molten lead containing tin as an impurity into the pool, injecting chlorine and oxygen gas into the molten lead in an amount to react with the tin present in the lead to form a tin-containing dross, the residence time of the molten lead in the reaction vessel being from 5 to 60 minutes, and separating the lead from the dross.

4,496,395

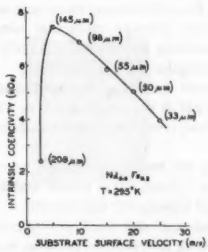
HIGH COERCIVITY RARE EARTH-IRON MAGNETS

John J. Croat, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 16, 1981, Ser. No. 274,070

Int. Cl.³ C22C *33/00*

U.S. Cl. 75—123 E **21 Claims**



1. A method of making an alloy with permanent magnetic properties at room temperature comprising the steps of forming a mixture of iron and one or more rare earth elements;

heating said mixture to form a homogeneous molten alloy; and

quenching said molten alloy at a rate such that it solidifies substantially instantaneously to form an alloy having an inherent room temperature magnetic coercivity of at least about 5,000 Oersteds as quenched.

4,496,396

METHOD AND APPARATUS FOR BURNING FINE GRAINED MATERIAL, PARTICULARLY RAW CEMENT MEAL

Eberhard Steinbiss, Düsseldorf; Horst Herchenbach, Hennef; Hubert Ramesohl, Bergisch Gladbach, and Albrecht Wolter, Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,275

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236652

Int. Cl.[3] C04B 7/50

U.S. Cl. 106—100 20 Claims

1. In a method for burning a fine grained product such as raw cement meal which comprises:

preheating said meal in a preheating stage,

calcining the preheated meal in a calcining stage,

burning the calcined meal into clinker in a burning stage, and

cooling the clinker in a cooling stage, the improvement which comprises:

rapidly heating said calcined meal to a temperature between 900° C. and 1250° C. by passing said meal in suspension in a gas in concurrent relation with hot gases in said burning stage,

grading the clinker into a coarse grained fraction and a fine grained fraction upon leaving said burning stage, and

separately cooling said coarse grained and fine grained fractions.

4,496,397

PROCESS FOR PURIFYING AND STABILIZING CATECHOL-CONTAINING PROTEINS AND MATERIALS OBTAINED THEREBY

J. Herbert Waite, Collinsville, Conn., assignor to University of Connecticut, Farmington, Conn.

Filed Mar. 7, 1984, Ser. No. 587,181

Int. Cl.[3] A23J 1/04; C07G 7/00; C08L 89/00; C09J 3/20

U.S. Cl. 106—161 29 Claims

1. A process for purifying and stabilizing catechol-containing polyphenolic proteins comprising the steps of:

(a) providing an acid soluble extract of a catechol-containing polyphenolic proteins in an acid medium;

(b) removing from the extract those acid soluble components having a low average molecular weight to provide a remaining extract fraction of relatively higher molecular weight catechol-containing proteins;

(c) reacting said remaining extract fraction with a soluble borate at a pH in the range of 7.0 to 9.0 to form selective soluble borate complexes of the catechol-containing proteins; and

(d) separating the borate complexes while maintaining the pH between 7.0 and 9.0 to permit stabilized storage of the proteins and subsequent use thereof.

20. A purified and stabilized polyphenolic proteinaceous material comprising polypeptide proteins rich in 3,4 dihydroxyphenylalanine (dopa) and hydroxyproline (hyp) having a molecular weight in the range of about 110,000–140,000 with a repeated decapeptide having an amino acid sequence wherein dopa is sequenced predominantly at positions five and nine and hyp is sequenced predominantly at positions six and seven; said material having a dopa/protein index of purity ratio of at least about 0.10 and being free from collagens and other alkaline-insoluble proteins incapable of forming borate complexes at a pH of 7.0–9.0.

4,496,398

ANTIREFLECTIVE COATING COMPOSITION

Daniel L. Whitehouse, Clarksburg, Md., assignor to Solarex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 341,128, Jan. 20, 1982, Pat. No. 4,411,703. This application Oct. 24, 1983, Ser. No. 544,975

Int. Cl.[3] C08L 1/28; C07F 7/28; B05D 1/18

U.S. Cl. 106—181 10 Claims

1. A composition suitable for application onto the light impinging surface of a substrate for forming an antireflective coating thereon comprising:

(a) a thickening or suspension agent;

(b) a metal alkoxide, said metal being selected from the group consisting of tantalum, titanium, niobium, yttrium, zirconium, tellurium, and mixtures thereof;

(c) a solvent for said thickening or suspension agent; and

(d) an anhydride containing four to twelve carbon atoms, said anhydride being present in an amount effective to provide a denser film of a higher refractive index.

4,496,399

METHOD AND AQUEOUS COATING COMPOSITIONS FOR FORMING ANTI-STICK AND INSULATIVE COATINGS ON SEMI-PROCESSED AND FULLY-PROCESSED ELECTRICAL STEELS

Michael H. Haselkorn, Franklin, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed May 21, 1984, Ser. No. 612,741

Int. Cl.[3] C23F 7/10

U.S. Cl. 148—6.15 R 20 Claims

1. An aqueous coating composition for forming an anti-stick and insulative coating on cold-rolled, non-oriented, semi-processed steel; cold-rolled, non-oriented, fully-processed steel; cold-rolled motor lamination steel; and punching quality oriented electrical steel, said coating composition having an inorganic portion and an organic portion, said inorganic portion comprising, on a water-free basis, from 3% to 11% by weight Al^{+++} calculated as Al_2O_3, from 3% to 15% by weight Mg^{++} calculated as MgO, from 78% to 87% by weight $H_2PO_4^-$ calculated as H_3PO_4, the total weight percentage of Al^{+++} (as Al_2O_3), Mg^{++} (as MgO) and $H_2PO_4^-$ (as H_3PO_4) being 100% on a water-free basis, said concentration of Al^{+++}, Mg^{++} and $H_2PO_4^-$ totaling 100 parts by weight on a water-free basis calculated as Al_2O_3, MgO and H_3PO_4, respectively, and an additional compound chosen from the class consisting of (1) from 33 to 250 parts by weight colloidal silica on a water-free basis, together with from 10 to 25 parts by weight chromic anhydride for every 100 parts by weight $H_2PO_4^-$ calculated as H_3PO_4, and (2) from 30 to 250 parts by weight aluminum silicate calculated as $Al_2O_3.SiO_2$ per 100 parts Al_2O_3, MgO and H_3PO_4 on a water-free basis, said inorganic portion containing by weight at least 60% water when colloidal silica is used and at least 40% water when aluminum silicate is used, said organic portion comprising an aqueous resin containing by weight at least 40% water, said organic and inorganic portions being combined so that the organic portion of the coating composition is present in an amount of from about 15 to about 1350 parts by weight per 100 parts Al_2O_3, MgO and H_3PO_4 on a water-free basis.

4,496,400

THIN STEEL SHEET HAVING IMPROVED BAKING HARDENABILITY AND ADAPTED FOR DRAWING AND A METHOD OF PRODUCING THE SAME

Toshio Irie, Chiba, and Susumu Sato, Ichihara, both of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

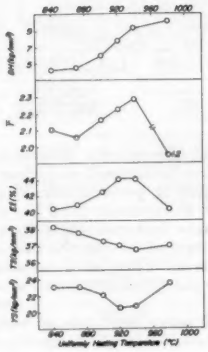
PCT No. PCT/JP81/00289, § 371 Date Jun. 16, 1982, § 102(e) Date Jun. 16, 1982, PCT Pub. No. WO82/01566, PCT Pub. Date May 13, 1982

PCT Filed Oct. 19, 1981, Ser. No. 395,049

Claims priority, application Japan, Oct. 18, 1980, 55-145951; Oct. 28, 1980, 55-150053; Nov. 25, 1980, 55-165536

Int. Cl.³ C21D *8/04*

U.S. Cl. 148—12 C 11 Claims



1. A thin steel sheet having high baking hardenability and adapted for drawing, having a composition consisting of 0.002–0.008% by weight of C; 0.05–1.2% by weight of Mn; not more than 0.5% by weight of Si; not more than 0.10% by weight of P; 0.01–0.1% by weight of Al, said amount being not less than 8 times amount of N incidentally incorporated into the steel; Nb in an amount within the range of from ((C content)×3) to ((C content)×8+0.02)% by weight; and the remainder being substantially Fe, and having an $\bar{r}$ value greater than 2.0, an ageing index of not higher than 4 kg/mm^2 and a bake-hardening degree of at least 5 kg/mm^2.

2. A method of producing a thin steel sheet having a high baking hardenability of at least 5 kg/mm^2, an ageing index of not higher than 4 kg/mm^2, an $\bar{r}$ value greater than 2.0, and adapted for drawing, comprising forming a molten steel having a composition containing 0.002–0.008% by weight of C; 0.05–1.2% by weight of Mn; not more than 0.5% by weight of Si; not more than 0.10% by weight of P; 0.01–0.10% by weight of Al, said amount being not less than 8 times amount of N incidentally incorporated into the steel; and Nb in an amount within the range of from ((C content)×3) to ((C content)×8+0.02)% by weight into a slab, hot rolling the slab, cold rolling the hot rolled sheet, subjecting the cold rolled sheet to a continuous annealing under a condition of a temperature of 750°–900° C. and a time of at least 10 seconds, and cooling the annealed sheet under a condition that the annealed sheet is cooled to a temperature of not higher than 650° C. at an average cooling rate of at least 10° C. per second.

4,496,401

CORROSION RESISTANT STEEL COMPONENTS AND METHOD OF MANUFACTURE THEREOF

Cyril Dawes, Sutton Coldfield, and John D. Smith, Solihull, both of England, assignors to Lucas Industries, Birmingham, England

Filed Oct. 8, 1982, Ser. No. 433,380

Claims priority, application United Kingdom, Oct. 15, 1981, 8131133; Dec. 18, 1981, 8138318; Feb. 26, 1982, 8205999; Jul. 15, 1982, 8220495

Int. Cl.³ C23C *11/14*

U.S. Cl. 148—16.5 17 Claims

1. A method of manufacturing a corrosion resistant non-alloy steel component comprising the steps of nitriding a non-alloy steel component and producing an epsilon iron nitride surface layer thereon, and subsequently heat treating the component in an oxidising atmosphere to provide an oxiderich surface layer consisting mainly of Fe_3O_4, said layer having a thickness which does not exceed 1 micrometer, and then quenching the component into an oil/water emulsion with the component at a temperature such that nitrogen is retained in solid solution in the ferritic matrix of the steel microstructure.

12. A nitrided corrosion resistant non-alloy steel component comprising:

(a) a ferritic matrix bearing nitrogen in solid solution in the steel microstructure thereof,

(b) an epsilon iron nitride or carbonitride layer of at least about 15 micrometers on said ferritic matrix, said epsilon iron nitride or carbonitride layer having an outer porous portion, (c) an oxide-rich layer consisting mainly of Fe_3O_4 and having a thickness of at least about 0.2 micrometers and which does not exceed about 1 micrometer on the epsilon nitride layer and

(d) an oil or wax layer absorbed into the outer porous portion of the epsilon nitride layer.

4,496,402

FE-CR-CO TYPE MAGNET BODY OF COLUMNAR STRUCTURE AND METHOD FOR THE PREPARATION OF SAME

Masaji Endo, and Takami Hikone, both of Osaka, Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Mar. 9, 1982, Ser. No. 356,262

Claims priority, application Japan, Mar. 10, 1981, 56-34795

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—31.57 7 Claims

1. An Fe-Cr-Co type magnet body consisting essentially of columnar structure having a maximum energy product $(BH)_{max}$ of 7 MGOe or higher consisting essentially of by weight ratio, 5–30% cobalt, 15–40% chromium, 0.1–10% molybdenum, 0.05–1.2% titanium and 0.1–5% vanadium, with the balance being iron and inevitable impurities, said body having been subjected to columnar crystallization treatment.

4,496,403
METHOD OF MAKING A COMPOUND SEMICONDUCTOR LASER

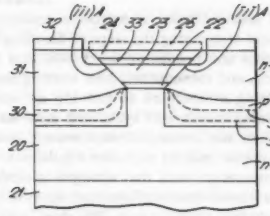
Stephen E. H. Turley, Harlow, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,618

Claims priority, application United Kingdom, Dec. 1, 1981, 8136167

Int. Cl.³ H01L 21/208

U.S. Cl. 148—171 **6 Claims**



1. A method of making a compound semiconductor buried rib heterostructure laser constructed in the InP/(In,Ga)(As,P) semiconductive system including the steps of growing by liquid phase epitaxy upon a semiconductive substrate three layers comprising an active layer sandwiched between upper and lower pasive layers of higher band gap and lower refractive index material than that of the active layer, of selectively etching through said active and passive layers to leave a protruding rib whose sides are profiled having regard to the crystal orientation such that in a subsequent step of epitaxial regrowth the nucleation on the sides of the rib at and above the active layer is discriminated against by said profile in favour of nucleation beneath said active layer whereby in said regrowth the regrowth up the sides of the rib is temporarily arrested in the vicinity of the junction between the active layer and the lower passive layer.

4,496,404
COMPOSITION AND PROCESS FOR TREATMENT OF FERROUS SUBSTRATES

Peter F. King, Farmington Hills, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Filed May 18, 1984, Ser. No. 611,663

Int. Cl.³ C23F 7/04

U.S. Cl. 148—6.14 R **16 Claims**

1. A process for treating ferrous substrates to inhibit surface corrosion thereof which comprises the steps of contacting the ferrous substrate with an aqueous acidic composition containing aluminum present in an amount up to its solubility limit, fluoride present in an amount up to about 200 ppm, up to about 1000 ppm of a second metal selected from the group consisting of zirconium, titanium, hafnium and mixtures thereof and hydrogen ions to provide a pH of about 2 to about 5.5, and thereafter rinsing the treated ferrous substrate.

4,496,405
EXPLOSIVE

Michael Cechanski, Skördevägen, Number 13, 713 00 Nora, Sweden

Filed Sep. 8, 1983, Ser. No. 530,465

Int. Cl.³ C06B 45/00

U.S. Cl. 149—2 **7 Claims**

1. In an explosive composition of water-in-oil having a discontinuous phase of an aqueous solution containing oxygen-releasing salts, the improvement in combination therewith comprising a high viscosity continuous phase of a carbonaceous fuel which is essentially wax-free having a liquid water-insoluble lipophilic polymer as a viscosity index improver in sufficient amount to produce a final composition adaptable to various geometrical shapes.

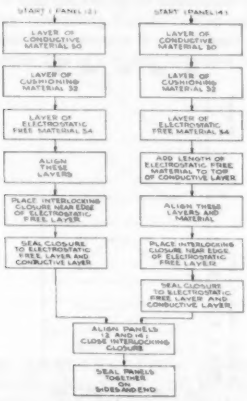
4,496,406
METHOD OF MAKING A CONDUCTIVE RESEALABLE POUCH

Karen A. Dedow, West Covina, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Division of Ser. No. 429,872, Sep. 30, 1982, Pat. No. 4,471,872. This application Jul. 11, 1983, Ser. No. 512,182

Int. Cl.³ B32B 31/10; B65D 85/42

U.S. Cl. 156—66 **4 Claims**


START (PANEL 12)
LAYER OF CONDUCTIVE MATERIAL 50
LAYER OF CUSHIONING MATERIAL 52
LAYER OF ELECTROSTATIC FREE MATERIAL 54
ALIGN THESE LAYERS
PLACE INTERLOCKING CLOSURE NEAR EDGE OF ELECTROSTATIC FREE LAYER
SEAL CLOSURE TO ELECTROSTATIC FREE LAYER AND CONDUCTIVE LAYER
START (PANEL 14)
LAYER OF CONDUCTIVE MATERIAL 50
LAYER OF CUSHIONING MATERIAL 52
LAYER OF ELECTROSTATIC FREE MATERIAL 54
ADD LENGTH OF ELECTROSTATIC FREE MATERIAL TO TOP OF CONDUCTIVE LAYER
ALIGN THESE LAYERS AND MATERIAL
PLACE INTERLOCKING CLOSURE NEAR EDGE OF ELECTROSTATIC FREE LAYER
SEAL CLOSURE TO ELECTROSTATIC FREE LAYER AND CONDUCTIVE LAYER
ALIGN PANELS 12 AND 14, CLOSE INTERLOCKING CLOSURE
SEAL PANELS TOGETHER ON SIDES AND END

1. A method for fabricating a reusable pouch for containing electro-sensitive electronic components comprising the steps of:

(a) forming a first panel by:
providing a first layer of conductive material;
placing a first layer of cushioning material on said first layer;
placing a first layer of electrostatic-free material on top of said layer of cushioning material;
aligning said first layers;
sealing a first interlocking closure strip to said electrostatic-free material and to the conductive material on opposite sides of the cushioning material;

(b) forming a second panel by:
providing a second layer of conductive material;
placing a second layer of cushioning material on said second layer;
placing a second layer of electrostatic-free material on the top of said layer of cushioning material;
aligning said second layers to each other;
sealing a second interlocking closure strip to said second layer of electrostatic-free material and to the second layer of conductive material, the second strip being selected to matingly engage with the first strip;

(c) inverting the second panel and placing it adjacent the first panel with the closure strips and conductive layers facing one another, respectively;

(d) aligning said first and second panels while interlocking said first and second closure strips; and

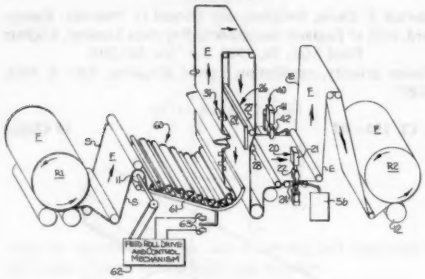
(e) sealing all said layers together on both side edges and the bottom edge to form a pouch which can be opened and closed by unlocking and interlocking the closure strips.

4,496,407

APPARATUS AND PROCESS FOR ULTRASONICALLY CUTTING OFF PREDETERMINED WIDTHS OF SELVAGES AND SEALING THE CUT EDGES OF TEXTILE FABRIC

Jack R. Lowery, Sr., Lancaster, and George L. Payet, Fort Mill, both of S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Nov. 28, 1983, Ser. No. 555,451
Int. Cl.³ B29C *27/08*; B32B *31/18*
U.S. Cl. 156—73.3 **7 Claims**



4. An apparatus for ultrasonically cutting off undesirable selvage and sealing the longitudinal cut edges of continuous lengths of textile fabric having at least some thermoplastic fibers therein and being characterized by a construction designed to cut off a predetermined width of the undesirable selvage from each side edge of the textile fabric regardless of transverse variations in the path of travel of the fabric through the apparatus or width of the fabric, said apparatus comprising

frame means;

means carried by said frame means for feeding the textile fabric in a longitudinal path of travel through said apparatus;

first ultrasonic cutting and sealing means mounted in a stationary position on said frame means for receiving one side edge of the moving textile fabric and for cutting off undesirable selvage and simultaneously sealing the cut edge along the one side edge;

means mounted on said frame means in advance of said first ultrasonic cutting and sealing means in the path of travel of the textile fabric through said apparatus for transverse shifting of the moving textile fabric to align the one side edge of the textile fabric with said stationary ultrasonic cutting and sealing means so that a predetermined width of the undesirable selvage will be cut off from the one side edge, said textile fabric shifting means comprising friction roll means transversely engaging the moving textile fabric and mounted on said frame means for movement transversely of the path of travel of the textile fabric for shifting the textile fabric therewith, drive means mounted on said frame means and connected with said friction roll means for being actuated to move said friction roll means back and forth predetermined distances, and means mounted on said frame means in advance of said friction roll means in the path of travel of the textile fabric for sensing the position of the one side edge of the moving textile fabric and for actuating said drive means;

second ultrasonic cutting and sealing means mounted on said frame means after said textile fabric shifting means in the path of travel of the textile fabric for movement in a direction transverse to the moving textile fabric and for receiving the other side edge of the moving textile fabric and for cutting off undesirable selvage and simultaneously sealing the cut edge along the other side edge; and

means mounted on said frame means and connected with said second ultrasonic cutting and sealing means for transverse shifting of said second ultrasonic cutting and sealing means to align said second ultrasonic cutting and sealing means with the other side edge of the moving textile fabric so that a predetermined width of the undesirable selvage will be cut off from the other side edge of the textile fabric regardless of transverse shifting of the textile fabric by said fabric shifting means or variations in the width of the textile fabric; said means for shifting said second ultrasonic cutting and sealing means comprises drive means connected with said second ultrasonic cutting and sealing means for being actuated to move said second ultrasonic cutting and sealing means back and forth predetermined distances, and means mounted on said frame means between said second ultrasonic cutting and sealing means and said textile fabric shifting means in the path of travel of the textile fabric for sensing the position of the other side of the moving textile fabric and for actuating said drive means.

6. Process for ultrasonically cutting off undesirable selvages and sealing the longitudinal cut edges of moving continuous lengths of textile fabric having at least some thermoplastic fibers therein and being characterized by cutting off a predetermined width of the undesirable selvage from each side of the moving textile fabric regardless of transverse variations in the path of travel of the fabric or width of the fabric, said process comprising

feeding the textile fabric in a longitudinal path of travel;

cutting off undersirable selvage and simultaneously sealing the cut edge along one side edge of the moving textile fabric by the use of a stationary ultrasonic mechanism as the fabric is fed thereby;

transversely shifting the moving textile fabric in advance of the stationary ultrasonic mechanism to align the one side edge of the fabric in a predetermined position with the stationary ultrasonic mechanism so that a desired width of the undesirable selvage will be cut off from the one side edge;

thereafter cutting off undesirable selvage and simultaneously sealing the cut edge along the other side edge of the moving textile fabric by the use of a transversely movable ultrasonic mechanism as the fabric is fed thereby; and

transversely shifting the movable ultrasonic mechanism into a predetermined position relative to the path of travel of the fabric past the movable ultrasonic mechanism so that a desired width of the undesirable selvage will be cut off from the other side edge.

4,496,408

METHOD FOR PRODUCING BIAXIALLY ORIENTED HOLLOW ARTICLES

Granville J. Hahn, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Continuation of Ser. No. 299,612, Sep. 4, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,624
Int. Cl.³ B29C *27/08, 17/04*
U.S. Cl. 156—73.5 **20 Claims**

1. A process for the production of a hollow article comprised of biaxially oriented thermoplastic resinous material, comprising the steps of:

providing a sheet of a thermoplastic material;

heating said sheet of thermoplastic material to a temperature above the orientation temperature of the thermoplastic material;

clamping an area of the heated thermoplastic sheet between a first mold half and a second mold half by closure of said mold halves, the first mold half containing a pre-form mold surface having a configuration predetermined to provide for a uniform wall thickness of the hollow article

to be formed, said surface being at a temperature which is not higher than the orientation temperature of the thermoplastic material, and the second mold half having a cavity which corresponds to the shape of the hollow article to be produced, said clamping mold closure causing the top of said pre-form mold surface to contact the thermoplastic sheet, whereby the sheet is caused to tent into said cavity;

directly after said clamping step, forcing the heated thermoplastic sheet by pressure differential, from said tented configuration into the first mold to instantaneously move it into contact against substantially the entirety of said pre-form mold surface;

maintaining the thermoplastic sheet in contact with said pre-form mold surface for a period of time sufficient to bring the thermoplastic sheet to its orientation temperature; and

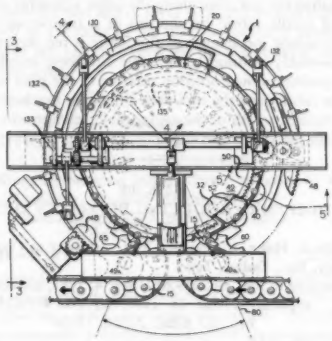
immediately thereafter forcing the thermoplastic sheet into the second mold half by means of a pressure differential which is sufficient to cause the thermoplastic sheet to conform with the cavity in the second mold half to form a hollow article, with a force sufficient to substantially, molecularly orient the thermoplastic material in both the longitudinal and lateral directions, wherein the process is repeated at a mold cycle time of from about 1.5 to 4 seconds.

4,496,409

METHODS AND MACHINES FOR PLACING AND HEATING ORIENTED PLASTIC HEAT-SHRINKABLE SLEEVES ON CONTAINERS

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 5, 1983, Ser. No. 510,482
Int. Cl.³ B29C *27/00*
U.S. Cl. 156—85 **13 Claims**



1. A machine for putting heat-shrinkable oriented plastic sleeves on containers, the machine comprising a turret having an upper portion and a lower portion, there being means for transporting containers around the periphery of the upper turret portion including a rope drive so constructed and arranged that a rope contacts the upper portion of the container and holds and simultaneously rotates each of the containers as the container is transported around the turret periphery, the lower turret portion including means for transporting tubular sleeves of heat-shrinkable plastic around the turret periphery, and means for bringing a sleeve from the bottom of each of the containers up and around the container to form a sleeve thereon.

11. A method of placing and heating heat-shrinkable oriented plastic sleeves on containers, the method comprising

A. supplying containers in an upright position for travel around a turret periphery;

B. engaging the neck of each container with a rope to hold and rotate each container as it travels around the turret periphery;

C. forming the sleeve around the container as it travels around the turret periphery; and

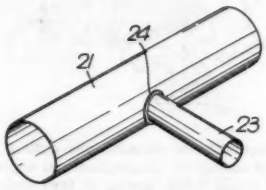
D. heating the sleeve to heat-shrink it around the container.

4,496,410

PRODUCTION OF DIMENSIONALLY RECOVERABLE ARTICLES

Frederick J. Davis, Swindon, and Donald G. Peacock, Kempsford, both of England, assignors to Raychem Limited, England

Filed Mar. 24, 1982, Ser. No. 361,294
Claims priority, application United Kingdom, Apr. 2, 1981, 8110397
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—84 **16 Claims**



1. A process for the production of a heat-recoverable article comprising at least two component parts having different directions of recovery, which process comprises

(a) deforming a first body of fusion bondable polymeric material constituting one of the component parts at a temperature below the softening point of the material to render the material heat-recoverable,

(b) forming a bond between one or more parts of the first body and a second body of fusion bondable polymeric material constituting another of the component parts which has been deformed at a temperature below the softening point of the material to render the material heat-recoverable, so that the direction of deformation of the first body is at an angle to the direction of deformation of the second body, and

(c) cross-linking the bond between the deformed first body and the second body.

4,496,411

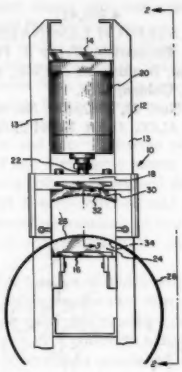
BEAD JAMMING OR CRIMPING METHOD

Richard A. Davies, Union City, Tenn.; Michael W. Lee, Arlington, Ky.; Frank A. Rodenberger, Woodland Mills, Tenn.; James R. Hill, Hokes Bluff, Ala.; David P. Kulavich, Attalla, Ala., and Donald L. Sowell, Jacksonville, Ala., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 423,733, Sep. 27, 1982, Pat. No. 4,452,660. This application Mar. 26, 1984, Ser. No. 593,561
Int. Cl.³ B29H *17/32*
U.S. Cl. 156—136 **4 Claims**

1. A method of crimping a bead ring having strands coated with an elastomeric material and coiled in a plurality of convolutions with the inside ends of the strands positioned at the radially inner surface of the ring and the outside ends of the strands positioned at the radially outer surface of the ring comprising hanging said bead ring over an inner groove of an inner die member, compressing said coated strands in said inner groove between the side portions of said groove by pressing an upper die member against said bead ring, compress-

ing said inside ends and said outside ends of the strands against said bead ring by movement of said upper die member and said



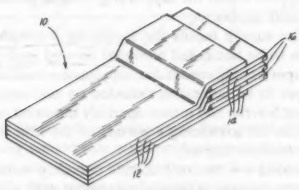
inner die member together, and removing said bead ring from said inner groove of said inner die member.

4,496,412

MULTIPLE LAP-JOINT FOR THERMOPLASTIC LAMINATES AND METHOD OF MAKING THE LAP-JOINT

James D. Ritter, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1984, Ser. No. 567,773
Int. Cl.³ B31F *5/00*; B32B *3/00*
U.S. Cl. 156—157 **1 Claim**



1. A method of forming a multiple lap-joint between two sheets of thermoplastic ply laminates, the steps including:
inserting high temperature film separators between the edges of the plies of the two laminate sheets;
heating and bonding together the plies of the two laminate sheets;
removing the film separators from the edges of the two sheets thereby forming feathered edges;
interleaving together the feathered edges of the sheets; and
reheating and bonding together the feathered edges of the sheets and forming a lap-joint therebetween.

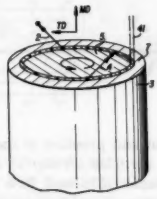
4,496,413

METHOD OF FORMING A BLOCKED CROSS-PLIED POLYMER FILM

Gordon V. Sharps, Jr., Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,658
Int. Cl.³ B29D *23/04*
U.S. Cl. 156—244.13 **5 Claims**

1. A method of manufacturing a polymer film comprising the steps of:
extruding at least one layer of polymer through a tubular die having inner and outer die walls defining an annular extrusion passage which terminates at an annular die gap;
rotating at least one of the die walls relative to the other to produce orientation of polymer molecules in the transverse direction in the extruded film;
feeding the extruded tubular film to a blocking means; and,



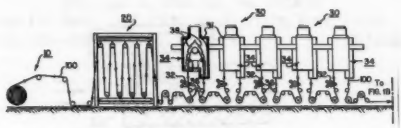
blocking the extruded film with said blocking means to produce a cross-plied layered film in which the transverse direction molecular orientation of one layer crosses the transverse direction molecular orientation of the other layer.

4,496,414

METHOD OF FORMING A BACKING MATERIAL

Merrill M. Smith, Morrisville, Pa., and Donald C. Ferguson, Trenton, N.J., assignors to American Biltrite, Inc., Cambridge, Mass.

Division of Ser. No. 234,402, Feb. 13, 1981, Pat. No. 4,379,185.
This application Aug. 13, 1982, Ser. No. 407,918
Int. Cl.³ B29D *3/02*; B32B *27/12*
U.S. Cl. 156—246 **2 Claims**



1. A method of forming a backing material comprising the steps of:
depositing a first layer of plastisol on a release paper, said first layer of plastisol having a thickness of at least approximately 6 mils (0.15 mm.);
depositing an open mesh webbing on said first layer;
depositing a second layer of plastisol on said webbing and first layer;
curing the two layers of plastisol to form a substantially unitary layer encompassing said webbing; and
stripping the release paper from the substantially unitary layer formed by curing.

4,496,415

METHOD FOR IMPREGNATING RESIN POWDER DIRECTLY INTO A LAMINATE LAY UP

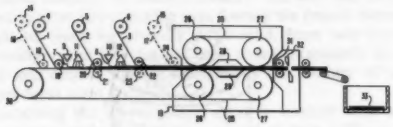
Gerhard R. Sprengling, Derry Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1982, Ser. No. 366,623
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—283 **14 Claims**

1. A method of making a metal clad laminate, useful for circuit boards, comprising the steps of:
(A) uniformly applying a uniform deposit of dry, thermosettable, B-staged resin particles as a powder, having a particle size of between about 20 microns and about 1,000 microns, directly onto a bare, porous, fibrous sheet mate-

rial, to provide a sheet uniformly covered with a uniform deposit of resin powder particles, and having resin powder particles sifted into interstices of the porous sheet,

(B) contacting the powder coated sheet with a metal foil sheet, and then



(C) applying heat and pressure to the sheets, to cause the resin powder particles on top of and sifted within the fibrous sheet material to melt flow into and through the fibrous sheet material, to fill the pores and impregnate the fibrous sheet material, and to also bond said impregnated sheet material to the metal foil, to provide a unitary, consolidated metal clad laminate.

4,496,416

METHOD AND APPARATUS FOR ADJUSTING AND MOUNTING OPTICAL COMPONENTS IN OPTICAL INSTRUMENTS

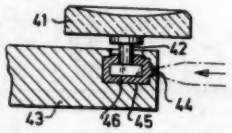
Meinrad Mächler, Ellwangen; Richard Sachse, Königsbronn; Horst Stacklies, Aalen, and Achim Schindler, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 478,892

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211867

Int. Cl.[3] **B29C** *19/00;* **B32B** *31/00;* **B31F** *5/00;* **B65H** *29/00*

U.S. Cl. 156—293 **18 Claims**



1. The method of adjusting the position of an optical unit relative to an optical instrument and mounting the optical unit on the optical instrument when the proper adjusted position has been determined, which comprises the steps of:

(a) providing an optical instrument;

(b) providing an optical unit to be adjusted relative to and then mounted on said instrument;

(c) providing an adjusting device separate from said instrument and capable of supporting said optical unit and also capable of moving said optical unit in a plurality of directions in space and of rotating it about a plurality of axes of rotation in space;

(d) attaching said device to said instrument and supporting said unit on said device;

(e) operating said device to effect precise adjustment of said unit relative to said instrument while said unit is unconnected to said instrument except through said device;

(f) firmly attaching said unit and said instrument to each other in the adjusted position of said unit by applying between adjacent portions of said unit and said instrument a flowable substance capable of hardening to form a firm connection; and

(g) detaching said device from said unit and said instrument and removing said device, after said substance has hardened, leaving said unit mounted in adjusted position on said instrument and maintained in said position by said hardened substance.

4,496,417

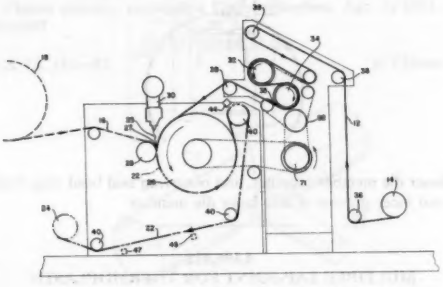
CONTROL STRETCH LAMINATING DEVICE

Joseph R. Haake, Broomfield; Tracy J. Fowler, Denver, and James W. Jensen, Boulder, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Nov. 12, 1982, Ser. No. 441,276

Int. Cl.[3] **B32B** *31/00, 31/04;* **B65H** *25/00;* **B65C** *11/04*

U.S. Cl. 156—361 **29 Claims**



1. An apparatus for laminating extensible film material to a paper material to form a laminated composite said apparatus having a continuous sheet of extensible film advancing therethrough comprising:

(a) support means for supporting various rotational elements of said apparatus;

(b) film supply means for supplying a continuous sheet of film to be laminated mounted on said support means;

(c) paper supply means for supplying a continuous sheet of paper to be laminated mounted on said support means;

(d) first S-wrap roll means operably mounted on said support means for advancing a portion of the film wrapped about the surface thereof;

(e) second s-wrap roll means operably mounted on said support means in parallel alignment with said first S-wrap roll, for advancing a portion of the film wrapped about the surface thereof said sheet of film being wrapped about said first and second S-wrap roll means in nonslipping frictional contact therewith in an S-shaped configuration whereby said film sheet is advanced by the rotation of said S-wrap rolls;

(f) S-wrap drive means linkingly attached to said first and second S-wrap roll means for rotating said S-wrap roll means in opposite directions;

(g) main roll means operably mounted on said support means for advancing a portion of the laminated composite wrapped about the surface thereof;

(h) main roll drive means linkingly attached to said main roll means for drivingly rotating said main roll means;

(i) compression roll means operably mounted in said support means in parallel alignment with said main roll means for rollingly compressing said sheet of film and said sheet of paper between said main roll means and said compression roll means whereby the film and paper are simultaneously laminated and advanced at a rate equal to the surface speed of said main roll means;

(j) composite take up means for collecting the composite formed from lamination of said film and paper, said take up means comprising a tension means for maintaining tension in said composite;

(k) stretch detection means for detecting the spacing between preprinted marks on said film;

(l) data processing means for receiving input from said stretch detection means and computing the stretch or relaxation in said film therefrom;

(m) speed control means for controlling the speed of said S-wrap drive means, said speed control means receiving control commands from said data processing means, said control commands being dependent on input from said stretch detection means;

wherein said first and second S-wrap rolls are positioned downstream of said film supply means, said main roll and said compression roll are positioned downstream of said first and second S-wrap rolls and said composite take up means is positioned downstream of said main roll and said compression roll with respect to the direction of said film advance; and

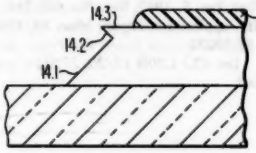
wherein the rate of rotation of said S-wrap rolls is selectably variable with respect to the rate of rotation of said main roll and compression roll during composite formation whereby the portion of said sheet of film positioned therebetween may be stretched or relaxed.

4,496,418

PROCESS FOR FORMING AN IMPROVED SILICON-ON-SAPPHIRE DEVICE

William E. Ham, Andover, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,616
Int. Cl.³ C23F *1/00*
U.S. Cl. 156—643 **10 Claims**



1. A process for forming a projection-free island of silicon, the island having slanted side walls producing a bottom surface that is broader and longer than the top surface thereof and characterized by the presence of an objectionable projecting point at the upper surface of the side walls adjacent the top surface, comprising the steps of:

forming a layer of masking material covering only a central portion of the top surface of the island, the remaining uncovered portion forming a border of exposed silicon around the outer edges of the top surface thereby exposing all of the projecting point; and

etching only the exposed portion of the island to remove the projecting point.

4,496,419

FINE LINE PATTERNING METHOD FOR SUBMICRON DEVICES

Jaime Nulman, Cali, Colombia, and J. Peter Krusius, Helsinki, Finland, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

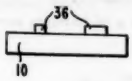
Continuation of Ser. No. 470,808, Feb. 28, 1983. This application Sep. 6, 1983, Ser. No. 529,661
Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **18 Claims**

1. A process for fine line patterning for submicron devices, comprising:

defining a fine line pattern in a positive resist;

transferring the fine line pattern to an underlying oxidation mask material to define therein a positive oxidation mask and to expose corresponding portions of the surface of a metal film underlying said oxidation mask layer;

oxidizing the exposed surface portions of said metal film through said oxidation mask to transfer said fine line pattern to said metal film;



COMPOSITE FILM PATTERN

removing said oxidation mask; and

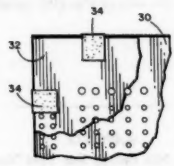
etching said metal film to selectively remove unoxidized portions of said metal film, thereby producing an inverted metal film pattern.

4,496,420

PROCESS FOR PLASMA DESMEAR ETCHING OF PRINTED CIRCUIT BOARDS AND APPARATUS USED THEREIN

Sigurd Frohlich, Santa Barbara, and James V. Morris, El Toro, both of Calif., assignors to BMC Industries, Inc., Saint Paul, Minn.

Filed Apr. 6, 1984, Ser. No. 597,676
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*
U.S. Cl. 156—643 **19 Claims**



1. An improved process for desmearing and etching the drilled apertures of a multilayered printed circuit board, the board of the type having a plurality of laminated layers, the process of the type that employs an evacuatable chamber having at least one pair of electrode plates for generating a plasma field therebetween; the improvement comprising the steps of:

providing a pair of metal shields, each such shield being substantially identical in configuration to said circuit board and being substantially identical in aperture pattern to said circuit board,

securing said shields to opposite surfaces of said printed circuit board in substantially congruent relation thereto,

subjecting said shields and circuit board to plasma desmear and etching within said plasma chamber for a selected period of time, and

removing said shields from said printed circuit board upon the withdrawal of said shields and circuit board from said plasma chamber.

4,496,421

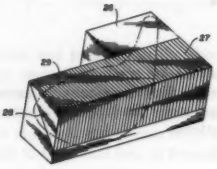
METHOD OF MAKING A GOLF CLUB

Larry W. Byars, Greenville, and Eric C. Jackson, Seneca, both of S.C., assignors to Tranoco, Inc., Travelers Rest, S.C. and Dunlop Sports Company, div. Dunlop Tire and Rubber Corp., Buffalo, N.Y.

Division of Ser. No. 398,967, Jul. 16, 1982, Pat. No. 4,432,550. This application Sep. 19, 1983, Ser. No. 511,986

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—304.1 **4 Claims**



1. A method of making a golf club head comprising forming on an uncompressed and undensified hard wood blank to become the body portion of a finished club head a substantially flat forward inclined face rising from the bottom of the blank, producing a wedge element for attachment to the blank on said inclined face of the blank by assemling in stacked relationship a multiplicity of pre-weighed wood laminations and compressing, densifying and adhesively uniting said laminations to impart to the wedge element a high degree of density and hardness and strength as an integrated structure, adhesively permanently uniting one substantially flat face of the wedge element with said inclined face of the blank, and then shaping the united blank and wedge element into a finished golf club head which includes a rear uncompressed hard wood body portion and a forward compressed and densified laminated wood wedge element whose forward face forms the striking face of a finished club head and extends substantially from heel to toe and from the sole to the top of the club head.

4,496,422

Patent Not Issued For This Number

4,496,423

GAS FEED FOR REACTIVE ION ETCH SYSTEM

Frank J. Walton, Sunnyvale, Calif., assignor to GCA Corporation, Bedford, Mass.

Filed Nov. 14, 1983, Ser. No. 550,801

Int. Cl.³ H01L *21/306*; C23F *1/00*

U.S. Cl. 156—345 **8 Claims**

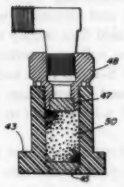
1. In a system for etching semi-conductor wafers by means of reactive ions in a gas plasma, the plasma being energized by an electrode which is adjacent the wafer and through which the gas is introduced, a gas feed comprising

a gas feed line which is electrically grounded;

a hollow insulating housing;

at one end of said housing, a porous metal plug which is in contact with said electrode;

at the other end of said housing; a second porous metal plug through which gas is fed from said feed line;



filling the space between said plugs, a porous insulating material.

4,496,424

METHOD FOR MANUFACTURE OF III–V COMPOUND SEMICONDUCTING SINGLE CRYSTAL

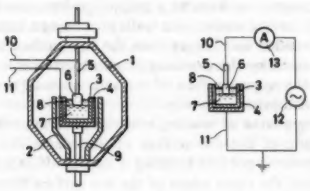
Kazutaka Terashima, Ebina, and Tsuguo Fukuda, Yokohama, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Technology, both of Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,734

Claims priority, application Japan, Mar. 30, 1982, 57-50031; Mar. 30, 1982, 57-50032

Int. Cl.³ C30B *15/20, 27/02*

U.S. Cl. 156—601 **3 Claims**

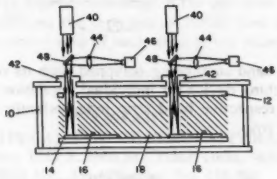


1. A method for the manufacture of a III–V compound semiconducting single crystal by the pulling technique using an encapsulant, which comprises allowing the molten mass of material for said crystal melted in advance under high pressure to be placed under a pressure lower than the pressure to be exerted during the work of pulling said crystal thereby causing said molten mass to generate bubbles, bringing a seed crystal into contact with said molten mass and applying a potential to said molten mass and measuring the magnitude of electric current flowing consequently to said molten mass, and when the results of the measurement indicate that the purity of said molten mass has reached a prescribed level, increasing the pressure enveloping said molten mass to a level appropriate for the work of pulling said molten mass thereby effecting the work for growth of said crystal.

4,496,425
TECHNIQUE FOR DETERMINING THE END POINT OF AN ETCHING PROCESS

Birol Kuyel, Hopewell Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jan. 30, 1984, Ser. No. 575,378
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—626 14 Claims



1. A method for detecting the end point of the etching of a pattern formed in a layer of material by etching through openings in an etch resistant coating on the surface of the material, the method comprising the steps of:

simultaneously etching: (1) the material, through the openings, and (2) a Fresnel zone plate, located proximate the pattern, comprised of a plurality of annular zones which are alternately formed of the etch resistant material and the exposed material to be etched;

monitoring light reflected from the Fresnel zone plate during etching; and

terminating the etch process when the intensity of light reflected from the Fresnel zone plate falls below a predetermined level.

4,496,426
PROCESS FOR THE CONTINUOUS EXTRACTION OF VEGETABLE-FIBER MATERIAL IN TWO STAGES

Manfred Baumeister, Gröbenzell, and Eugen Edel, Munich, both of Fed. Rep. of Germany, assignors to MD-Verwaltungsellschaft Nicolaus GmbH & Co. KG, Munich, Fed. Rep. of Germany

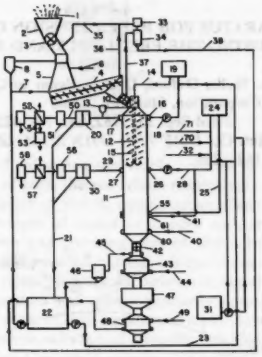
Filed Apr. 6, 1983, Ser. No. 482,462
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212767
Int. Cl.³ D21C 3/02, 3/20
U.S. Cl. 162—19 13 Claims

1. A process for the continuous extraction of fibrous vegetable material comprising the steps of:

(a) impregnating an amount of fibrous vegetable matter with an organic solvent solution; then

(b) in a first extraction stage, digesting said fibrous vegetable material in a first extraction liquid comprising a mixture of methanol and water in a ratio of about 90:10 for a period of about 40 to about 120 minutes at a temperature of about 180° C. to about 210° C. and a pH of between about 3.8 to about 4.9; thereafter,

(c) in a separate second extraction stage, further digesting said fibrous material in a second extraction liquid for a



period of about 10 to about 80 minutes at a temperature of about 150° C. to about 190° C., said second extraction liquid comprising:

(i) said first extraction liquid from step (b);

(ii) an additional amount of water;

(iii) an aqueous sodium hydroxide solution in an amount of from about 5% to about 30% by weight of sodium hydroxide to dry wood; and

(iv) between about 0.01% and about 0.15% by weight of anthraquinone to dry wood.

4,496,427
PREPARATION OF HYDROPHILIC POLYOLEFIN FIBERS FOR USE IN PAPERMAKING

Robert W. Davison, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 14, 1980, Ser. No. 112,030
Int. Cl.³ D21H 5/12
U.S. Cl. 162—157.5 7 Claims

1. A process for the preparation of water-dispersible, uniformly hydrophilic polyolefin fibers which comprises forming an aqueous suspension of spurted polyolefin fibers, adding to said suspension, with stirring, an aqueous solution of a water-soluble ionized reagent capable of being converted into hy-

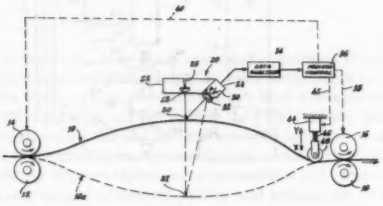
drated particles submicron in size, said ionized reagent being selected from the group consisting of the alkali metal and ammonium salts of rosin and modified rosins and mixtures thereof, and then adding to the fiber dispersion so formed an inorganic ionic precipitant for said ionized reagent, said inorganic ionic precipitant being selected from the group consisting of alum, sulfuric acid, blends of alum and sulfuric acid, and water-soluble calcium and magnesium salts, thereby effecting precipitation of said hydrated solid particles onto the surface of the polyolefin fibers.

4,496,428

APPARATUS FOR PAPER TENSION CONTROL BY MEASURING THE FREQUENCY AND FLUTTER OF A WEB

Henry A. Wells, Oxford, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 23, 1982, Ser. No. 422,001
Int. Cl.³ D21F *7/00*; G01N *21/86*; G01V *9/04*
U.S. Cl. 162—256 **7 Claims**



1. In an apparatus for moving a material web along a path, said apparatus having a driven roller for moving the web along the path, a web tension controller composing:

(a) first means spaced apart from the path of movement of the web, said first means being operable to project an energy beam onto a surface of the web along a line which is substantially perpendicular to the surface of the web, which energy beam is reflected by the web;

(b) second means spaced apart from the path of movement of the web and disposed on the same side thereof as said first means, said second means being operable to detect the energy beam reflected by the web to provide an indication of the spatial position of the web to enable measurement of the frequency and amplitude of flutter of the web; and

(c) control means operably connected to said second means for adjusting the tension of the web in response to variations in the spatial position of the web detected by said second means to maintain the frequency and amplitude of flutter of the web within a predetermined range.

4,496,429

EXTENDED NIP PRESS FOR A PAPER MACHINE

Kari Salminen, Ylöjärvi, and Nils Söderholm, Anjala, both of Finland, assignors to Oy Tampella Ab, Tampere, Finland

Filed Mar. 25, 1983, Ser. No. 478,907
Claims priority, application Finland, Apr. 1, 1982, 821139
Int. Cl.³ D21F *3/02, 3/06*
U.S. Cl. 162—358 **3 Claims**

1. An extended nip press for a paper machine for removing water from a wet paper, cardboard or that kind of a fibrous or porous web, which press comprises

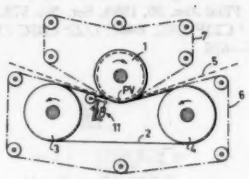
a rotatable press roll,

a press band, which includes several separate, parallel, running band strips, said band strips being close to each other in a pressure zone, said band strips being pressed against said press roll for forming an extended nip press zone with said press roll,

at least two band rolls, over which said press band passes,

at least one dewatering felt, which runs between said press roll and said press band for conveying said web to be dried through said press zone, and

stretching devices for regulating tension of said band strips,



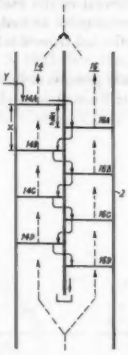
each band strip being equipped with its own respective stretching device for individual regulation of the tension of a respective band strip independently of each other band strip.

4,496,430

MASS TRANSFER APPARATUS

Arthur E. O. Jenkins, Porthcawl, Wales, assignor to Distillation Technology Limited, England

Filed Jan. 11, 1982, Ser. No. 338,541
Claims priority, application United Kingdom, Jan. 22, 1981, 8101937; May 18, 1981, 8105192
Int. Cl.³ B01D *3/26*
U.S. Cl. 202—158 **8 Claims**



1. A mass transfer apparatus which includes a columnar section to extend generally vertically during use, the columnar section containing a plurality of liquid/vapour contacting stages in axially spaced relationship with a downcomer for transferring a liquid stream from each stage to the next down the section and with space for upward vapour flow between the stages, said section further containing an axially extending divider which divides said upward vapour flow space into two parallel zones such that the vapour flow up the section will be in two parallel and separate streams, the liquid/vapour contacting stages being such that each zone has a plurality of the liquid/vapour contacting stages located at axially spaced intervals therealong with the locations of the stages in one zone being staggered axially relative to those of the stages in the other zone along the columnar section, each liquid/vapour contacting stage comprising an active liquid/vapour contact area and an inlet for the supply of liquid to the active area and outlet for the draining of liquid from the active area, each outlet being connected by a downcomer for liquid flow therethrough to an inlet of an active area of the next lower stage in the section whereby liquid flow down the section will be directed alternately from one zone to the other as it is passed successively from stage to stage down the section, the inlet and

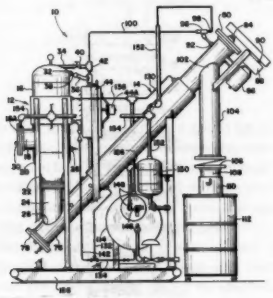
outlet of each stage being disposed on opposite sides of the active area and to the same side of the divider as the active area such that liquid flow from the inlet across the active area to the outlet will be generally rectilinear and parallel to the divider, and the location along the width of the divider of the active area of the stages in one zone corresponding with that of the corresponding active area of the stages in the other zone, and the locations of the inlet and outlet for the active area of the stages of the one zone corresponding with those of the outlet and inlet, respectively, of the corresponding active area of the stages of the other zone whereby the direction of liquid flow across the active area of each stage in the one zone will be in the opposite sense to the direction of liquid flow across the corresponding active area of each stage in the other zone.

4,496,431

CENTRIFUGAL EVAPORATION APPARATUS

Leslie L. Fowler, 1722 E. 59th St., Tulsa, Okla. 74105

Filed Aug. 23, 1982, Ser. No. 410,586
Int. Cl.³ B01D *1/24, 3/00*
U.S. Cl. 202—83 **11 Claims**



1. A centrifugal evaporation system for use in reclaiming used industrial solvent having water and solid contaminant therein, comprising:

a heated cyclonic still into which the contaminated solvent is injected in a manner to cause the contaminated solvent to move cyclonically within the still, the still having a bottom discharge opening, a vapor outlet, and a contaminated solvent inlet;

an inclined elongated heated closed conveyor-dryer having an inlet opening adjacent the lower end positioned under and connected directly to said still bottom discharge opening, the still serving to vaporize the solvent and water content of the contaminated sovent, the solid contaminant passing out said bottom discharge opening of said still as a wet sludge, the slude being drained of liquid and dried as it is upwardly conveyed in the conveyor-dryer, the closed conveyor-dryer having a vapor outlet and a solids discharge outlet adjacent its upper end;

a condenser having a vapor inlet and a liquid outlet;

conduit means connecting said cyclonic still vapor outlet and said conveyor-dryer vapor outlet to said condenser vapor inlet, the vapor being condensed to liquid in said condenser;

a separator having an inlet connected to receive liquid from said condenser liquid outlet, a water outlet, and a solvent outlet, the water and sovent liquids being separated in the separator for separate discharge; and

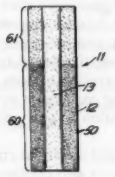
a dry slude receptacle having closed communication with said conveyor-dryer solids discharge outlet for receiving the solids extracted from the contaminated solvent.

4,496,432

ELECTROLYTIC METHODS FOR ENHANCING CONTRAST BETWEEN METALLIC SURFACES

Delbert A. Nauman, Indianapolis, Ind., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,382
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—1 T **6 Claims**



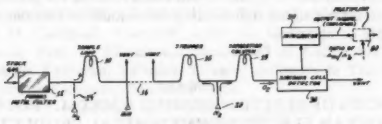
1. A method of enhancing the visible contrast in electrical contact material of parts thereof which respectively are, first, a substrate consisting of nickel, copper or an alloy primarily constituted by weight of nickel or copper and, second, an overlay bonded to and covering part of said substrate and provided by a noble metallic material selected from the group consisting of the noble metals gold, ruthenium, rhodium, platinum, iridium, osmium and alloys primarily constituted by weight of one or more of such metals, said method comprising, providing an aqueous solution of a readily soluable ionizable solute, applying an alternating voltage of a value in the range from about 3 r.m.s. volts a.c. to about 10 r.m.s. volts a.c. to a circuit comprising said electrolyte, a first electrode constituted of said substrate and overlay, and a second electrode in contact with said electrolyte and spaced from said first electrode, and exposing said substrate and overlay to current produced in said electrolyte by application of said voltage for a time period sufficient to produce noticeable visible darkening of the surface of said substrate relative to the surface of said overlay.

4,496,433

APPARATUS AND METHOD FOR DETERMINING THE AMOUNT OF A SAMPLE GAS COMPONENT

Raymond Annino, North Smithfield, R.I.; Maynard C. Cheney, Norfolk, and Kenneth S. Fletcher, Rehoboth, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Dec. 28, 1983, Ser. No. 566,345
Int. Cl.³ G01N *27/58, 31/08*
U.S. Cl. 204—1 T **24 Claims**



1. An instrument for determining the amount of a selected gas component in a sample, comprising:

a solid-electrolyte oxygen-sensor cell;

means to furnish a continuous stream of oxygen at a fixed rate to the region adjacent one side of said cell;

voltage supply means coupled to said cell to develop a potential thereacross for transporting through said cell all of the oxygen present at said one side whereby the cell current normally is at a constant background level corresponding to said fixed rate of oxygen supply;

means to combine said selected gas component with said continuous stream of oxygen, so as to alter for a period of time the amount of oxygen available for transport through said cell; and

means responsive to the cell current for integrating the

deviation in current from said constant background level during said period of time, whereby the amount of said selected gas component may be determined by coulometric measurement effected by such integration.

8. Apparatus as claimed in claim 1, wherein said instrument forms part of a package supported within the stack of a boiler to monitor the stack gases;

said package further including chromatographic separation means to furnish said instruments with separated components of the stack gas.

12. The method of determining the weight of a selected sample gas component, comprising the steps of:

applying a continuous fixed-rate stream of oxygen to one side of a solid-electrolyte oxygen sensor cell;

transporting all of the oxygen on said one side through said cell by the application to said cell of an electrical potential;

sensing the background electrical current flow through said cell corresponding to said continuous stream of oxygen;

combining said selected gas component with the oxygen of said continuous stream, thereby to produce an altered electrical current flow corresponding to changes in oxygen available for transport through said cell as said component combines with the oxygen of said continuous stream; and

integrating the difference in current between said background current flow and said altered current flow to determine the weight of said component.

22. A stack gas analyzer comprising:

a protective outer shell arranged to extend through an access port in the stack to be monitored, and to be supported in that position;

a chromatographic separation column in said shell;

chromatographic sampling means in said shell for obtaining samples of the stack gas and directing said samples to the input end of said column;

a gas component detector comprising a solid-electrolyte oxygen-sensor measurement cell with one side thereof presented to a sealed chamber within said shell;

means coupling the output end of said column to said chamber;

means to supply oxygen to said chamber and to provide for combining such oxygen with at least one component of the gas sample;

means to supply oxygen to said chamber and to provide for combining such oxygen with at least one component of the gas sample;

a voltage source having positive and negative terminals connected respectively to the sides of said oxygen-sensor cell to provide a measurement current corresponding to the amount of oxygen transported through said cell; and

means responsive to said measurement current for producing an output signal representing the amount of said one sample component.

4,496,434

PROCESS OF ELECTROFORMING A METAL PRODUCT AND AN ELECTROFORMED METAL PRODUCT

Gerhardus H. Morssinkhof, Boxmeer, Netherlands, assignor to Stork Screens B.V., Netherlands

Filed Nov. 14, 1983, Ser. No. 551,303

Claims priority, application Netherlands, Nov. 12, 1982, 8204381

Int. Cl.³ C25D *1/08, 7/00*

U.S. Cl. 204—11 **12 Claims**

1. A process of electroforming a metal screen by subjecting a first product skeleton formed upon a matrix in a first electrolytic bath and subsequently stripped from the matrix, to an electrolysis in a second electrolytic bath, comprising at least a metal structure having a hardness and ductility different from that of said metal screen and an organic compound improving a growth of metal in a direction substantially perpendicular to the plane of the skeleton, in which the first skeleton thickened in the second electrolytic bath is subjected to an electrolysis in at least one other electrolytic bath, also comprising at least a metal structure having a hardness and ductility different from that of said metal screen and an organic compound improving the growth of metal on the outer surface of the screen in a direction substantially perpendicular to said outer surface, said organic compound being a class 2 brightener containing a double or triple bond other than the =C—S=O group and presenting properties of a second class brightener, the said screen thickened in the second electrolytic bath being subjected to electrolysis in at least one other electrolytic bath, said other electrolytic bath also comprising at least said organic compound improving growth of metal on the outer surface of the thickened screen in a direction substantially perpendicular to said outer surface and causing the deposit of metal different from the metal deposited from the second bath.

4,496,435

METHOD OF MANUFACTURING THIN FILM CIRCUITS

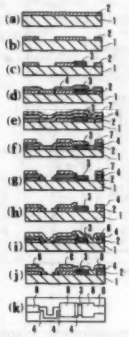
Keiji Harada, and Akio Sato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,821

Claims priority, application Japan, Feb. 8, 1983, 58-19217

Int. Cl.³ H01C *17/00*

U.S. Cl. 204—15 **11 Claims**



1. A method of manufacturing a thin film circuit comprising the steps of:

forming a tantalum film on insulating substrate;

covering a predetermined region of said tantalum film with a titanium film;

heat treating a resulting assembly;

removing said titanium film; and

covering said predetermined region with a metal film to provide ohmic contact therebetween.

3. A method of forming a thin film circuit including capacitor elements and resistor elements which are formed on the same insulating substrate, comprising the steps of:

forming a tantalum film for capacitor on said insulating substrate;

etching said tantalum capacitor film to form a predetermined circuit pattern;

anodizing a portion of said tantalum capacitor film to convert said portion into a dielectric layer of said capacitor;

forming a tantalum film for resistor on the entire surface of said substrate;

forming a titanium film on said tantalum resistor film;

patterning said titanium film to remove a portion thereof except portions at which conductor patterns and external lead terminal connectors are formed;

patterning said tantalum resistor film to form the resistor element;

removing a portion of said tantalum resistor film overlying said dielectric layer;

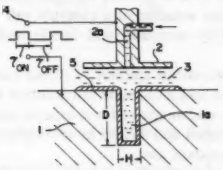
heat treating said resistor element for stabilizing the same;

etching off said titanium film;
forming a metal film on the entire substrate; and
patterning said metal film to form terminals or conductor patterns of said resistor and capacitor elements.

4,496,436
PULSE ELECTRODEPOSITING METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation of Ser. No. 828,902, Aug. 29, 1977, abandoned. This application Dec. 27, 1978, Ser. No. 973,608
Claims priority, application Japan, Sep. 1, 1976, 51-104724; Dec. 14, 1976, 51-150051; Jun. 10, 1977, 52-69129
Int. Cl.³ C25D *5/18*
U.S. Cl. 204—23 **8 Claims**



1. A method of electrodepositing a metal upon a workpiece from an electrolyte, said method comprising the steps of:
juxtaposing a surface of said workpiece formed with a recess having a depth D and a width H with an electrode having an electrode surface extending over the opening of said recess and disposed outside the recess;
flushing the electrolyte in the region of said electrode surface past said surfaces and through said recess; and
applying an electric current poled to electrodeposit metal from said electrolyte upon said workpiece and in the recess thereof to a uniform thickness, the ratio D/H being greater than 1/1 and up to 10/1, said electric current being passed through said electrode, said electrolyte and said workpiece in the form of pulses having a pulse duration between 1 and 50 microseconds.

4,496,437
METHOD FOR PRODUCING A DUAL POROSITY BODY

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 22, 1983, Ser. No. 506,912
Int. Cl.³ C25D *7/04*
U.S. Cl. 204—24 **14 Claims**

1. A method for producing a dual porosity body from a substrate having a plurality of passageways traversing the substrate and connecting a first surface with a generally opposing second surface, said method comprising
depositing a solid material onto the walls of at least a portion of the passageways adjoining only the first surface;
controlling the depth of penetration of the electrodeposition solution into the substrate by exposing one surface of the substrate to a pressurized gas; and
stopping the deposition when the diameter of the passageways being coated has been reduced to a predetermined value, wherein the solid material is deposited by a method selected from the group consisting of electroplating and electroless plating from an electrodeposition solution.

4,496,438
BATH COMPOSITION AND METHOD FOR COPPER-TIN-ZINC ALLOY ELECTROPLATING

Raymond L. Helton; Douglas W. Trobough, both of Beaverton, and Marianne McPherson, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 24, 1983, Ser. No. 508,292
Int. Cl.³ C25D *3/58*
U.S. Cl. 204—44 **22 Claims**

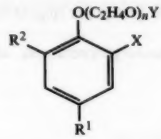
15. An electroplating bath composition for plating an alloy of copper, tin, and zinc, comprising a solution having a predetermined amount of copper, tin and zinc ions and an effective amount of nickel ions, available in the form of nickel acetate present in a concentration of about 0.004 oz/gal, sufficient to promote the plating of a corrosion-resistant, bright silvery-colored plate of copper-tin-zinc alloy.

4,496,439
ACIDIC ZINC-PLATING BATH

Norbert Greif, Bobenheim; Knut Oppenlaender, Ludwigshafen; Albert Hettche, Hessheim, and Christos Vamvakaris, Kallstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 565,217
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248503
Int. Cl.³ C25D *3/22*
U.S. Cl. 204—55 R **2 Claims**

1. An aqueous acidic plating bath for the electrolytic deposition of zinc, which contains conductive salts, brighteners and surfactants, wherein one of the surfactants is a surfactant of the formula I



I

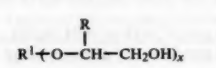
where R^1 is C_4–C_{20}-alkyl, R^2 is identical to R^1 or is hydrogen, X and Y are each a radical $—SO_3H$, where the hydrogen atom can be replaced by an alkali metal or alkaline earth metal atom or by one equivalent of zinc and n is an integer from 5 to 50.

4,496,440
OXIDATION OF HYDROPHOBIC $—CH_2OH$ COMPOUNDS AT OXIDIZED NICKEL ANODES

Kent D. Campbell, Concord; Aylin H. Gulbenkian, Walnut Creek; Fred Y. Edamura, Concord, all of Calif., and Demetrios Kyriacou, Salonica, Greece, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 4, 1984, Ser. No. 617,063
Int. Cl.³ C25B *3/02*
U.S. Cl. 204—78 **14 Claims**

1. The method of oxidizing a $—CH_2OH$ group in a hydrophobe to a —CHO or —COOH group which comprises electrochemically oxidizing said hydrophobe, in a basic aqueous medium, at an oxidized nickel anode, said hydrophobe being selected from the group consisting of:
(A) glycol ethers of the formula

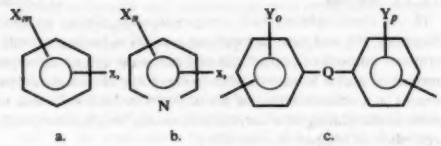


(I)

wherein
x=1 or 2,
R=H or a C_1–C_{40} hydrocarbyl or heterohydrocarbyl radi-

cal, optionally substituted with one or more non-interfering radicals,

R^1 is a mono- or divalent radical of one of the following formulas a, b or c



a. b. c.

wherein

x is 1 or 2,

X is halo, haloalkyl, alkyl, alkenyl, amino, nitro, alkoxy or haloalkoxy, independently in each occurrence,

m is 0 to 5 and n, o and p are each, independently, 0–4,

Q is a valence bond, a C_1–C_4 alkylene or alkenylene group, $>C(CF_3)_2$, —CO—, —S—, —SO_2— or —O—; and

Y is halo, alkyl, alkenyl alkoxy, haloalkoxy or nitro, independently in each occurrence,

with the provisos that:

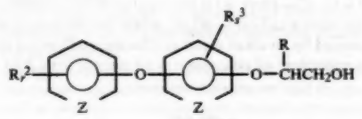
the maximum number of nitro groups per ring is 3 in formula a and 2 in formulas b and c;

the maximum number of alkyl, alkenyl, alkoxy and/or haloalkoxy groups per ring is 2 in formulas a and b and 1 in formula c;

the maximum number of amino groups per ring, in formulas a and b, is 2; and

the maximum number of haloalkyl groups per ring, in formulas a and b, is 2;

(B) phenoxyaryl- or phenoxyheteroaryloxyethanols of the formula



(II)

wherein

r=0, 1, 2, 3 or 4 and

s=0, 1, 2 or 3,

Z=CH or N, in one occurrence and N in the other,

R^2, independently in each occurrence, is alkyl, alkenyl, haloalkyl, halo, nitro, amino, C_2–C_{42} alkoxy or haloalkoxy or is —$OCHRCH_2OH$,

R is as defined with regard to formula I; and

R^3, independently in each occurrence, is alkyl, alkenyl, haloalkyl, halo, nitro, amino, alkoxy or haloalkoxy;

with the provisos that:

not more than one R^2 or R^3 group per ring is nitro,

not more than two R^2 or R^3 groups per ring are haloalkyl,

not more than one R^2 or R^3 group per ring is amino,

not more than one R^2 or R^3 group per ring is alkoxy or haloalkoxy,

not more than one R^2 is O—$CHRCH_2OH$,

not more than one R^2 or R^3 group per ring is alkyl or alkenyl; and

(C) polycycloaliphatics ring-substituted by one or two —CH_2OH groups and, optionally, with one or more non-interfering radicals.

4,496,441

DESULFURIZATION OF COAL

Charles T. Sweeney, and John K. Bird, both of Waco, Tex., assignors to Tetravalent Inc., Waco, Tex.

Filed Aug. 17, 1983, Ser. No. 523,843

Int. Cl.³ C25B *1/34, 9/00*

U.S. Cl. 204—98 20 Claims

1. A method for coal desulfurization which comprises

providing an oxidant gas generator comprising a hollow container having a wall dividing the same into two compartments and including an ion-permeable membrane permitting flow of cations therethrough,

a cathode in one of said compartments,

an anode in the other of said compartments,

a bipolar electrode in said other compartment positioned between said anode and said membrane,

said bipolar electrode being of a size and shape permitting free circulation of electrolyte therearound and being exposed on all sides to the same aqueous electrolyte,

providing water to said cathode compartment,

providing a water solution of a chloride salt to said anode compartment to surround said anode and said bipolar electrode,

passing a predetermined amount of direct current through said water and said a chloride salt solution to produce an oxidant gas at said anode and said bipolar electrode and to produce hydrogen and solium hydroxide at said cathode,

collecting said oxidant gas,

providing a quantity of sulfur-containing coal,

comminuting said sulfur-containing coal,

providing a gas/solid reactor,

supplying said comminuted sulfur-containing coal to said reactor, and

introducing said oxidant gas into said reactor and reacting the same with said sulfur-containing coal to oxidize and remove the sulfur components therein.

4,496,442

PROCESS FOR GENERATING HYDROGEN GAS

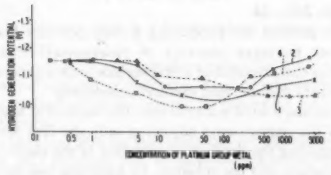
Toshimasa Okazaki; Akihiro Sakata; Kyozi Nagai, and Kazuo Nakashima, all of Aichi, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 292,981, Aug. 14, 1981, abandoned. This application Apr. 12, 1983, Ser. No. 482,519

Claims priority, application Japan, Aug. 14, 1980, 55-111066

Int. Cl.³ C25B *1/04, 1/14, 1/16*

U.S. Cl. 204—129 8 Claims

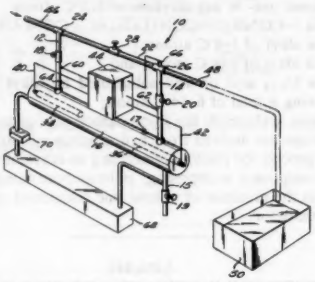


1. In a process for generating hydrogen gas by electrolysis of an aqueous alkali solution, the improvement comprising using a cathode produced by electrically plating the surface of an electrode substrate in a nickel plating bath having fine carbonaceous particles dispersed therein.

4,496,443
METHOD FOR ELECTRICALLY INTRODUCING SUBSTANCES INTO LIQUID SOLUTION

Michael H. Mack, 15111 Pipeline St.; Sterling C. Corley, 13149 6th St., both of Chino, Calif. 91710, and Leland G. Cole, P.O. Box 11812, Santa Ana, Calif. 92711

Filed Jun. 8, 1982, Ser. No. 386,358
Int. Cl.³ C25B 1/20
U.S. Cl. 204—130 8 Claims



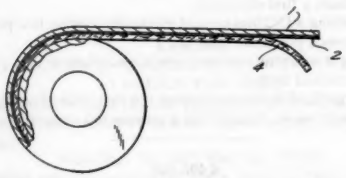
1. A process for treating magnesium deficiency in organisms comprising:

introducing into feed water ingested by the organism an effective amount of dissolved and suspended gelatinous, lyophilic colloids containing magnesium and its compounds obtained from electrolytically oxidizing a magnesium anode in said water.

4,496,444
METHOD OF CORROSION PROTECTION

Luigi Bagnulo, Milan, Italy, assignor to Caunned Aktiengesellschaft, Liechtenstein, Liechtenstein

Division of Ser. No. 793,870, May 4, 1977, abandoned, which is a continuation of Ser. No. 619,777, Oct. 6, 1975, abandoned, which is a continuation of Ser. No. 459,685, Apr. 10, 1974, abandoned. This application Jan. 5, 1981, Ser. No. 222,757
Claims priority, application Italy, Apr. 19, 1973, 23191 A/73; Feb. 11, 1974, 20367 A/74
Int. Cl.³ C23F 13/00
U.S. Cl. 204—148 22 Claims

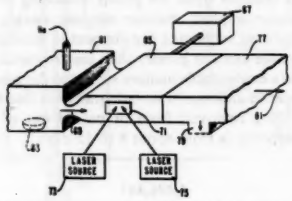


1. A method of anticorrosion protection of long steel pipes and other such structures, similar to that afforded by zinc plating, the method comprising the steps of providing an elongated continuous first layer of such corrodible metal as can serve as sacrificial-anode material; arranging on said first layer an elongated continuous second layer of electrically conductive adhesive composition which is adherent to metal surfaces so that said second layer extends along the entire length of, is bonded to and is in electrically conductive surface contact with said first layer over the whole of the facing surfaces of said first and second layers, whereby an elongated flexible anticorrosion tape is produced; and applying the thus-produced anti-corrosion tape at the side of said second layer onto long steel pipes or other such structures by spirally winding or otherwise putting on, so that said second layer and thereby also said first layer extends along the surface of the long steel pipes or other structures, and whereby said second layer and thus said first layer is bonded with, and is in electrically conductive surface contact there with.

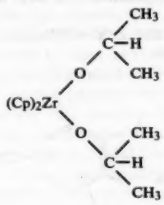
4,496,445
SEPARATION OF ISOTOPES OF ZIRCONIUM

Robert J. Nadalin, Penn Hills Township, Allegheny County, and Robert G. Charles, Allison Park, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

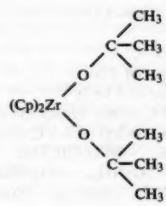
Filed Sep. 7, 1982, Ser. No. 415,095
Int. Cl.³ B01D 59/00
U.S. Cl. 204—158 R 5 Claims



1. The method of producing zirconium having a low neutron-absorption cross section for use in parts of a nuclear reactor the said method comprising producing a material comprising one or more compounds selected from the group consisting of dicyclopentadienyl zirconium dichloride, $(Cp)_2ZrCl_2$, dicyclopentadienyl zirconium di-isopropoxide



and dicyclopentadienyl zirconium di-tert-butoxide,



which are hydrolysis resistant, said material containing a plurality of isotopes of zirconium, subjecting the vapor of said material to radiation emitted from a carbon dioxide laser tuned to the vibration of an excitable bond directly or indirectly associated with a selected ^{s}Zr isotope of said material, whereby the ^{s}Zr component of said material is decomposed, separating the product of the decomposition of the ^{s}Zr component from the remainder of said irradiated material, and forming the said parts of that one of the separated ^{s}Zr component of said material or of the remainder of said material in which the zirconium has the minimum neutron-absorption cross section.

4,496,446

MODIFICATION OF POLYGLYCOLIC ACID STRUCTURAL ELEMENTS TO ACHIEVE VARIABLE IN-VIVO PHYSICAL PROPERTIES

Thomas A. Ritter, Bristol; Alan L. Kaganov, Stamford, and John P. Budris, Cheshire, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 198,565, Oct. 20, 1980, abandoned, and a continuation-in-part of Ser. No. 198,566, Oct. 20, 1980, abandoned. This application Jun. 16, 1983, Ser. No. 505,137

Int. Cl.[3] **C08G** *63/70;* **C08J** *3/28, 7/10*

U.S. Cl. 204—159.14 **3 Claims**

1. A method of modifying a structural surgical element made from a bioabsorbable polymer having a glycolic ester linkage to controllably effect a rapid loss of its in vivo tensile strength, said element selected from the group consisting of a tubular support, tubular implant, tubular stenotic device and ring device, comprising subjecting the element to irradiation treatment in a dosage amount greater than that required for sterilization and in a controllable manner such that the time required for the element to undergo in vivo degradation into fragments, capable of being removed from or passed out of the body without absorption, is from about 8 to 15 days.

4,496,447

AROMATIC-ALIPHATIC KETONES USEFUL AS PHOTOINITIATORS

Jürgen Eichler, Weiterstadt; Claus Herz, Heidelberg; Karl-Heinz Neisius, and Gregor Wehner, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

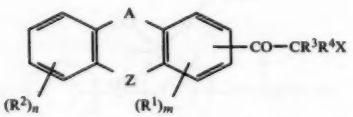
Division of Ser. No. 240,439, Mar. 4, 1981, Pat. No. 4,374,984. This application Dec. 21, 1982, Ser. No. 451,673

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 30084118

Int. Cl.[3] **C08F** *2/50;* **C07D** *335/16, 311/86*

U.S. Cl. 204—159.16 **7 Claims**

1. A compound of the formula



wherein

A is —CO— or —CO—CO—;

X is —OR[5];

Z is —S—, or —O—;

m is O or an integer of 1 to 3;

n is O or an integer of 1 to 3;

R^1 is alkyl of 1–12 C atoms, cycloalkyl of 5–6 C atoms, aryl of 6–14 C atoms, aralkyl of 7–9 C atoms, —OH, —OAlk, —OAr, —SAlk, —SCH_2CH_2OH, —SAr, —SO_2Alk, —SO_2phenyl, —SO_2NH_2, —SO_2NHAlk, —$SO_2N(Alk)_2$, —COOAlk, —NH_2, —NHAlk, —$N(Alk)_2$, —NHCOphenyl, —CN or halogen;

R^2 can be any of the groups defined for R^1 or another —CO—CR^3R^4X group;

R^3 is H, alkyl of 1–8 C atoms, or alkyl of 1–8 C atoms substituted by —OH, —OAlk, acyloxy of 2–8 C atoms, —NR^8R^9, —COOAlk or —CN, or is alkenyl of 3–5 C atoms;

R^4 can be any of the groups defined for R^3 or —$CH_2CH_2R^{13}$;

R^5 is H, alkyl of 1–12 C atoms or alkyl of 1–8 C atoms substituted by —Cl, —Br, —OH, —OAlk, —SAlk, acyloxy of 2–8 C atoms, —COOAlk, —CONHAlk, —$CON(Alk)_2$ or —CN, or is alkenyl of 3–5 C atoms, or cyclohexyl;

R^8 is alkyl of 1–12 C atoms, or alkyl of 2–4 C atoms substituted by —OH, —OAlk or —CN, or is alkenyl of 3–5 C atoms, or cyclohexyl;

R^9 is alkyl of 1–12 C atoms, or alkyl of 2–4 C atoms substituted by —OH, —OAlk or —CN, or is alkenyl of 3–5 C atoms, or cyclohexyl, or, together with R^8, is alkylene of 4–5 C atoms or C_{4-5}-alkylene interrupted by —O— or —NR^{14}—, or, together with R^4, is alkylene of 1–9 C atoms, oxa- or aza-alkylene of 2–3 C atoms;

R^{13} is —$CONH_2$, —CONHAlk, or —$CON(Alk)_2$;

R^{14} is alkyl of 1–4 C atoms;

Alk is alkyl of 1–4 C atoms; and

Ar is C_{6-14} aryl or aryl substituted by alkyl groups and having a total of 6–14 C atoms;

wherein aryl stands for hydrocarbon aryl groups and acyl groups are derived from hydrocarbon carboxylic acids.

4. A process for photopolymerizing an ethylenically unsaturated compound, comprising, photopolymerizing the compound in the presence of at least one compound of claim 1 as a photoinitiator.

4,496,448

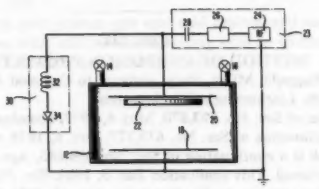
METHOD FOR FABRICATING DEVICES WITH DC BIAS-CONTROLLED REACTIVE ION ETCHING

King L. Tai, and Frederick Vratny, both of Berkeley Heights, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 13, 1983, Ser. No. 541,459

Int. Cl.[3] **C23C** *15/00*

U.S. Cl. 204—192 E **13 Claims**



1. A method for fabricating a device, comprising the steps of:

establishing a plasma in a gaseous atmosphere which contacts a first electrode;

establishing a DC bias on said electrode relative to a point of reference potential; and

etching a substrate with entities in said plasma

characterized in that:

said method further comprises the step of discharging said electrode in response to a preselected criterion.

4,496,449

ELECTRON BEAM ETCHING OF INTEGRATED CIRCUIT STRUCTURES

Jorge J. Rocca, and George J. Collins, both of Fort Collins, Colo., assignors to Colromm, Inc., Fort Collins, Colo.

Filed Dec. 16, 1983, Ser. No. 562,457

Int. Cl.[3] **C23C** *15/00*

U.S. Cl. 204—192 E **20 Claims**

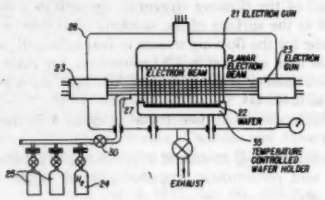
1. Electron beam induced etching apparatus for etching a surface of a solid material, the apparatus comprising:

a large area glow discharge electron gun for producing an energy controlled homogeneous source of collimated beam electrons travelling perpendicular to the surface of the solid material to be etched;

chamber means surrounding the large are glow discharge electron gun and the solid material to be etched to provide a controlled low pressure gas environment;

means for controlling the energy, current, and time dependence of the beam electrons;

means for selecting, admitting, and controlling the partial pressures of one or more gases in said chamber means; and



vacuum pump means for circulating the one or more gases through said chamber means.

4,496,450

PROCESS FOR THE PRODUCTION OF A MULTICOMPONENT THIN FILM

Hajime Hitotsuyanagi; Nobuhiko Fujita; Hideo Itozaki, and Hiromu Kawai, all of Itami, Japan, assignors to Director General of Agency of Industrial Science and Technology Michio Kawata, Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,828

Claims priority, application Japan, Mar. 1, 1983, 58-53850

Int. Cl.[3] **C23C** *15/00*

U.S. Cl. 204—192 R **15 Claims**

1. A process for the production of a multicomponent thin film, characterized by using jointly a sputtering method and a plasma CVD method at a pressure of not lower than a pressure capable of giving the maximum rate of film formation in the sputtering method.

4,496,451

ION EXCHANGE MEMBRANE MANUFACTURE FOR ELECTROLYTIC CELL

Tsuneji Ishii; Hiroaki Ito, and Takamichi Ishikawa, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,016

Claims priority, application Japan, May 22, 1981, 56-76751; May 22, 1981, 56-76752

Int. Cl.[3] **C25B** *9/00, 11/03, 13/08*

U.S. Cl. 204—252 **17 Claims**

1. A method of manufacturing an ion exchange membrane for use in an electrolytic cell comprising an anode, a cathode, an anode compartment, a cathode compartment, and a gas and liquid permeable porous non-electrode layer bonded to at least one surface of said ion exchange member, which comprises:

coating electric non-conductive or conductive particles on the surface of a support to form a thin layer,

drying the thin layer on the support,

transferring said dried thin layer onto said surface of said membrane, and

bonding said thin layer to said membrane by the application of heat and pressure.

4,496,452

APPARATUS AND PROCESS FOR PRODUCING CHLORINE GAS AND FOR EMPLOYING SUCH CHLORINE GAS FOR THE PRODUCTION OF CHLORINE WATER

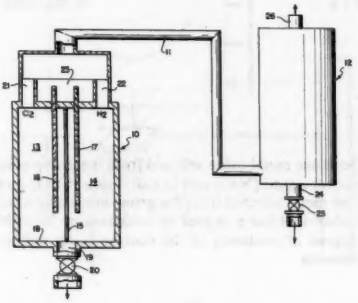
Guiseppe Bianchi, Milan, Italy, assignor to Industrie Zanussi S.p.A., Pordenone, Italy

Filed Dec. 7, 1983, Ser. No. 559,023

Claims priority, application Italy, Dec. 23, 1982, 24932 A/82

Int. Cl.[3] **C25B** *9/00;* **C02C** *5/12*

U.S. Cl. 204—266 **3 Claims**



1. An apparatus for producing chlorine gas and for employing said chlorine gas for the production of chlorine water, said apparatus comprising:

an electrolytic cell for the electrolysis of a sodium chlorine solution, said cell comprising a cathode compartment having therein a cathode for producing hydrogen during electrolysis and an anode compartment having therein an anode for producing chlorine gas during electrolysis, single conduit means at the bottom of said cell for charging sodium chloride solution into said compartments and for discharging therefrom solutions resulting from electrolysis, and a porous partition substantially separating said compartments, said partition having a lower end terminating above the bottom of said cell at said charging and discharging means, such that lower ends of said compartments are in free communication;

an absorption tower for contacting chlorine gas produced in said anode compartment with water, and thereby for forming chlorine water; and

means for supplying the hydrogen and chlorine gas produced in said compartments to said absorption tower, and for dynamically balancing the pressure in said compartments and thereby preventing mixing of the products of electrolysis from said cathode and anode compartments, said supplying and balancing means comprising a chamber connected to upper ends of said compartments for receiving therefrom and mixing said hydrogen and chlorine gas, and a conduit for passing the thus mixed gases to said absorption tower.

4,496,453

HYDROGEN-EVOLUTION ELECTRODE

Mitsuo Yoshida, and Hiroyuki Shiroki, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 219,518, Dec. 23, 1980, abandoned. This application Aug. 22, 1983, Ser. No. 525,603

Claims priority, application Japan, Dec. 26, 1979, 54-168180; Nov. 11, 1980, 55-157582

Int. Cl.[3] **C25B** *11/04, 11/02*

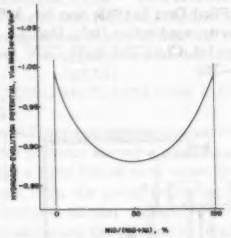
U.S. Cl. 204—290 R **17 Claims**

1. In a hydrogen-evolution electrode comprising an electri-

cally conductive substrate and a coating formed on the surface of said substrate, the improvement in which:

said electrically conductive substrate is nickel or a nickel alloy;

said coating on the surface of said substrate comprises at



least one metal oxide selected from the group consisting of nickel oxide (NiO) and cobalt oxide (CoO) and at least one metal selected from the group consisting of nickel and cobalt and has a degree of oxidation of 20 to 90%, said degree of oxidation of the coating being defined by the formula

$$\frac{H_1}{H_1 + H_0} \times 100$$

wherein H_0 represents the height of a peak showing the intensity of the highest intensity X-ray diffraction line of a metal selected from the group consisting of nickel and cobalt when the coating is analyzed by X-ray diffractometry; H_1 represents the height of a peak showing the intensity of the highest intensity X-ray diffraction line of an oxide of said metal; and in case the coating contains nickel, cobalt and oxides thereof, H_0 represents the arithmetic mean of the above-mentioned heights of peaks obtained with respect to the metals contained in the coating and H_1 represents the arithmetic means of the above-mentioned heights of peaks obtained with respect to oxides of said metals; and

said coating is a coating fabricated by the melt-spraying of an anti-corrosive powder material comprising at least one member selected from the group consisting of nickel, cobalt, nickel oxide and cobalt oxide.

4,496,454

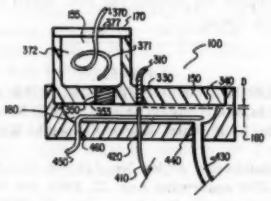
SELF CLEANING ELECTROCHEMICAL DETECTOR AND CELL FOR FLOWING STREAM ANALYSIS

Terry A. Berger, Landenberg, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 19, 1983, Ser. No. 543,663

Int. Cl.³ G01N *31/08*

U.S. Cl. 204—402 **27 Claims**



1. An electrochemical detector for detecting electroactive species in a flowing stream, comprising a detector cell having true wall-jet hydrodynamics, said detector cell having:

a counter electrode;

a working electrode with a surface of nominal radius R;

a fluid inlet jet having an orifice with an outer diameter A and an inner diameter a aligned with the center of the surface of the working electrode for supplying substantially all of the flowing stream to the cell in a direction normal to the surface of the working electrode; and

an exit tube for the flowing stream to leave the cell; wherein R is less than or equal to 1.5 millimeters, the ratio of R/a is greater than or equal to 4, and the ratio A/a is less than or equal to 4.

19. An electrochemical detector as in claim **1** further comprising:

a potentiostat having an output coupled to the counter electrode, said potentiostat responsive to an input control signal; and

output amplifier means coupled to the working electrode for measuring the electrical output signal of the detector cell.

20. An electrochemical detector as in claim **19** wherein the potentiostat output comprises a cyclic waveform having

a first period at an oxidizing potential for oxidizing the surface of the working electrode,

a second period at a reducing potential for reducing the surface of the working electrode, and

a third period at a working potential, less than the absolute value of the oxidizing and reducing potentials for measuring the electrochemical species in the fluid in the detector cell.

4,496,455

POLAROGRAPHIC SENSOR AND SENSING SYSTEM FOR DETERMINING OXYGEN CONTENT IN GASES

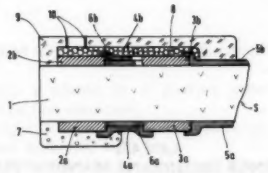
Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen; Klaus Müller, Tamm, and Franz Rieger, Aalen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 604,985

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315654

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—412 **7 Claims**



1. Polarographic sensor system to determine oxygen content in test gases having

a sensor element (S) exposed to the test gases and a first current source (B1),

said sensor element comprising

a solid electrolyte body (1);

a first cell including

a cathode (2*a*);

a gas diffusion layer (7) exposed to the test gases and covering said cathode; and

an anode (2*b*);

the first current source (B1) being connected across the cathode and anode to cause a limit current to flow therethrough, and comprising, in accordance with the invention,

a second cell including a cathode (3*a*) and an anode (3*b*);

means (8,9) to define an oxygen molecule communication duct between the anode (2*b*) of the first cell and the anode (3*b*) of the second cell,

the cathode (3*a*) of the second cell being exposed to the test gas; and

a second current source (B2) connected across the cathode (3*a*) and anode (3*b*) of the second cell to provide pumping energy for oxygen molecules to the anode of the second cell,

the communication duct (8,9) guiding pumped oxygen to the anode (2*b*) of the first cell.

4,496,456

METHOD FOR PREPARING THIN REGENERATED CELLULOSE MEMBRANES OF HIGH FLUX AND SELECTIVITY FOR ORGANIC LIQUIDS SEPARATIONS

Mahmoud M. Hafez, Sarnia, Canada, and Henry W. Pauls, Durham, N.C., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 3, 1983, Ser. No. 500,966

Int. Cl.[3] **C10G** *73/08;* **B01D** *13/00*

U.S. Cl. 208—33 **30 Claims**

1. A method for producing a regenerated cellulose membrane comprising the steps of:

A. dissolving a cellulose material to form a solution;

B. Casting the cellulose solution into a film;

C. coagulating the cellulose solution film using an alcoholic-alkali solution;

D. washing the coagulated cellulose film in an alcohol;

E. regenerating the washed, coagulated cellulose film using an alcoholic acid solution;

F. washing the regenerated cellulose membrane using an alcohol.

25. A regenerated cellulose membrane prepared by the method of:

A. dissolving a cellulose material to form a solution;

B. casting the solution into the form of a film;

C. coagulating the cellulose solution film using an alcoholic alkali solution;

D. washing the coagulated cellulose film in an alcohol;

E. regenerating the washed, coagulated cellulose film using an alcoholic acid solution;

F. washing the regenerated cellulose film in an alcohol.

28. In a process for the dewaxing of waxy hydrocarbon oils comprising:

(a) solvent dewaxing the waxy hydrocarbon oil by combining the waxy oil with a dewaxing solvent selected from C_3–C_6 ketones and mixtures thereof, and mixtures of C_3–C_6 ketones and C_6–C_{10} aromatic hydrocarbons for a mixture and chilling said waxy oil-solvent mixture to form a slurry comprising solid particles of wax and a mixture of dewaxed oil and dewaxing solvent;

(b) passing said slurry to solid-liquid separation means to separate the solid particles of wax from the dewaxed oil/solvent mixture; and

(c) contacting at least a portion of said dewaxed oil/solvent mixture, under pressure, with one side of at least one semipermeable membrane made from regenerated cellulose to form a permeate richer in said solvent than said mixture and a retentate leaner in said solvent than said mixture, wherein said membrane is prepared from a hydrophilic regenerated cellulose membrane by sequentially permeating through the membrane, under a differential pressure across the membrane, a series of solvents of decreasing polarity wherein adjacent solvents in the series exhibit bulk liquid-liquid miscibility with each other and wherein the last solvent exhibits bulk liquid-liquid miscibility with the dewaxing solvent to be permeated through the membrane, the improvement comprising using as the membrane a regenerated cellulose membrane prepared by the method of:

(i) dissolving a cellulose material to form a solution;

(ii) casting the cellulose material into a film;

(iii) coagulating the cellulose solution film using an alcoholic alkali solution;

(iv) washing the coagulated cellulose film in an alcohol;

(v) regenerating the washed, coagulated cellulose film using an alcoholic acid solution;

(vi) washing the regenerated cellulose film in an alcohol.

4,496,457

ROTOR-TYPE MAGNETIC PARTICLE SEPARATOR

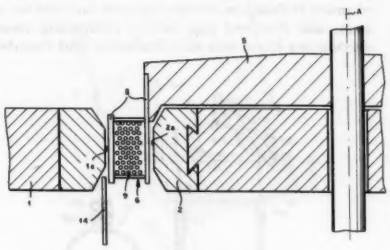
Alfred Schickel, Freiberg, German Democratic Rep., assignor to Veb Schwermaschinenbau-Kombinat "Ernst Thälmann" Magdeburg, Magdeburg, German Democratic Rep.

Filed Sep. 24, 1982, Ser. No. 422,848

Claims priority, application German Democratic Rep., Sep. 29, 1981, 233668

Int. Cl.[3] **B03C** *1/14*

U.S. Cl. 209—223 R **9 Claims**



1. A magnetic separator comprising:

a support defining an upright axis;

two stationary pole pieces spaced from and around said axis on said support;

a stationary inner ferromagnetic piece extending between said pole pieces and axially bridging same, said inner piece defining with said pole pieces respective angularly off-set gaps;

means for energizing said pole pieces and thereby creating a magnetic field extending radially across said gaps and through said inner piece;

an annular rotor centered on said upright axis and extending through said gaps, said rotor being formed of an endless annular succession of groups of nonradially extending and spaced-apart wholly nonmagnetic rotor elements disposed in an annulus around said inner piece;

means for rotating said rotor about said axis and thereby orbiting said rotor elements through said gaps;

means for feeding particulate material including magnetically attractable particles axially down through said gaps for interception by said elements of said rotor as said rotor rotates to orbit said elements through said gaps; and

means for washing said particles from said elements at a location angularly offset from said gaps.

4,496,458

DIALYSIS APPARATUS AND TECHNIQUE

Kyu H. Lee, King of Prussia, Pa., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Continuation of Ser. No. 799,582, May 23, 1977, abandoned, and a continuation-in-part of Ser. No. 629,082, Nov. 5, 1975, abandoned. This application Jul. 9, 1979, Ser. No. 55,881

Int. Cl.[3] **B01D** *31/00*

U.S. Cl. 210—90 **12 Claims**

7. An artificial kidney comprising a tubular casing having a first end, a second end, and an internal chamber;

first and second securing flanges,

said first flange encircling, and extending outwardly from, said casing near the first end thereof and said second flange encircling, and extending outwardly from, said casing near the second end thereof;

a bundle of hollow dialysis fibers in said internal chamber, said bundle of fibers having a first set of fiber ends and a second set of fibers ends,

the first set of fiber ends being potted in a potting resin

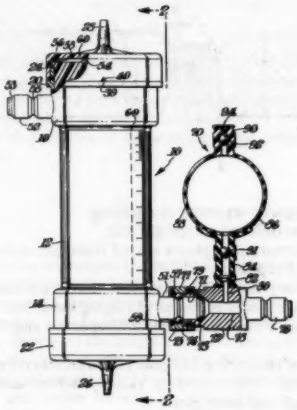
which defines a first internal wall near the first end of the casing,

the second set of fiber ends being potted in a potting resin which defines a second internal wall near the second end of the casing,

first and second end caps, each of said end caps comprising a body portion and a skirt portion and each skirt portion having an end edge;

first and second gaskets;

the end edge of the skirt portion of said first end cap being bonded to said first securing flange and said first gasket being disposed in sealing relationship between said first internal end wall and said first end cap, whereby there is provided at the first end of said casing a first sealed end chamber in fluid communication with said first set of fiber ends, said first end cap further comprising means for introducing blood into said first sealed end chamber;



the end edge of the skirt portion of said second end cap being bonded to said second securing flange and said second gasket being disposed in sealing relationship between said second internal end wall and said second end cap, whereby there is provided at the second end of said casing a second sealed end chamber in fluid communication with said second set of fiber ends, said second end cap further comprising means for withdrawing blood from said second sealed end chamber; one of said caps having a passageway therethrough at a location outside the sealed-in chamber associated with said one of said caps;

the lumens of said h llow fibers providing a path for the flow of blood between said first sealed end chamber and said second sealed end chamber;

said casing further comprising an inlet for liquids and an outlet for liquids, each said inlet and outlet being in fluid communication with the internal chamber of said casing and located between said first interior wall and said second interior wall.

4,496,459

FLEXIBLE FILTER DEVICE WITH MEANS TO POSITION FILTER BAG

Borje O. Rosaen, 4031 Thornoaks, Ann Arbor, Mich. 48104

Filed Nov. 4, 1983, Ser. No. 549,246

Int. Cl.³ B01D *27/10*

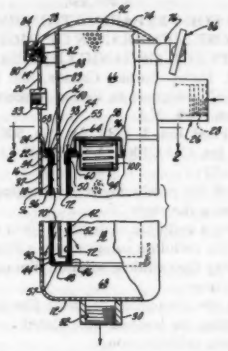
U.S. Cl. 210—310 **10 Claims**

1. A fluid filtering device comprising:

a tubular housing having an interior wall, an open top and defining an interior chamber,

said housing having an inlet and an outlet open to said chamber,

a filter assembly removably insertable into said chamber through said open top and to a filtering position in which said filter assembly is positioned between said inlet and said outlet, said filter assembly comprising a flexible filter bag having an outer periphery and a rim secured around said outer periphery, said rim engaging a portion of said housing when said filter assembly is in said filtering position,



a cover movable with respect to said housing between an open and a closed position in which said cover closes the open end of said housing,

means for detachably securing said cover to said housing when said cover is in said closed position,

means carried by said cover for engaging and pushing said filter bag away from said open top of said housing as said cover is moved from said open and to said closed position.

4,496,460

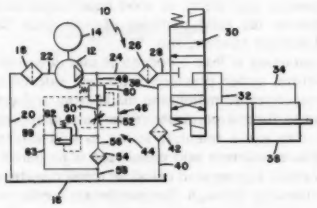
SECONDARY FLOW FLUID FILTER

Richard O. Haarstad, New Brighton, and Jerry L. Kammerer, Plymouth, both of Minn., assignors to Hydraulic Specialty Company, Minneapolis, Minn.

Filed Aug. 11, 1983, Ser. No. 522,349

Int. Cl.³ B01B *29/36*

U.S. Cl. 210—132 **7 Claims**



1. In a fluid circulation circuit including a powerdriven pump for creating high pressure flow from a reservoir through a full flow first filter and a fluid use device for return to said reservoir, a combination comprising:

a second filter;

base means for holding said second filter, said base means including a pressure reducing device upstream from said second filter, said device reducing fluid pressure from the high pressure of a high pressure line in said circuit, said base means further including means for limiting fluid flow rate to said second filter;

first means for communicating a portion of the fluid flowing in said high pressure line to said base means; and

second means for communicating fluid from said base means downstream from said second filter to said reservoir;

whereby said second filter continuously filters a portion of flowing fluid, said second filter being exposed through said pressure reducing device to controlled inlet pressure less than the working high pressure to said first filter and through said limiting means to predetermined flow rates of fluid so that said second filter may filter smaller contaminants than said first filter.

4,496,461

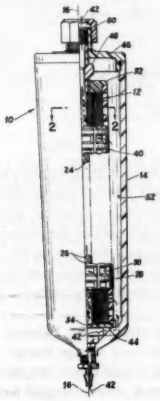
CHROMATOGRAPHY COLUMN

Gordon Leeke, Glastonbury; Chaokang Chu, E. Hartford, and Nils L. Dailey, Wallingford, all of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed Jun. 17, 1983, Ser. No. 505,532

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **20 Claims**



1. A chromatography column for effecting chromatographic separation of at least two components of a sample flowing radially therethrough comprising:

a housing;

at least one solid stationary phase in said housing having a longitudinal axis, said phase having chromatographic functionality and being effective for chromatographic separation;

a means for radially distributing the sample through the stationary phase;

a means for collecting the sample after the sample has radially flowed through the stationary phase;

wherein the stationary phase comprises:

(a) a swellable fibrous matrix in sheet form having chromatographic functionality and being effective for chromatographic separation, spirally wound around the longitudinal axis of the solid phase to form a plurality of layers around the axis;

(b) a spacer means between each layer separating the layers for permitting controlled swelling of the matrix and enhancing the distribution of sample flowing radially through the stationary phase by channelling the sample flow through the matrix and substantially evenly dispersing the sample axially and circumferentially across the matrix.

4,496,462

ANCHORING DEVICE

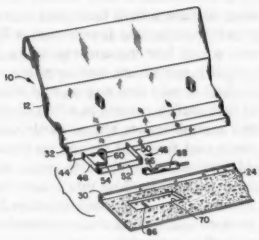
Richard W. Steinkraus, 5111 Willowbrook La., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 541,127, Oct. 12, 1983, which is a continuation-in-part of Ser. No. 497,117, May 23, 1983, which is a continuation of Ser. No. 341,074, Jan. 20, 1982, Pat. No. 4,391,706. This application Oct. 14, 1983, Ser. No. 541,965

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.³ B01D *33/24, 33/34*

U.S. Cl. 210—232 **18 Claims**



18. An anchoring device for anchoring a grid relative a frame member of a filter pan, comprising in combination:

an aperture defined by the grid;

an open topped housing rigidly connected to the grid, said open top of said housing registering with said aperture;

an orifice defined by said housing;

an anchoring strap of inverted U-shaped configuration rigidly connected to the frame member of the filter pan for anchoring said housing relative the frame member, said strap removably extending through said orifice;

tapered means for cooperating with said anchoring strap, said tapered means being removably wedged between said anchoring strap and said housing; and

a tapered surface of said tapered means, said tapered surface cooperating with said strap to wedge said tapered pin between said strap and said housing.

4,496,463

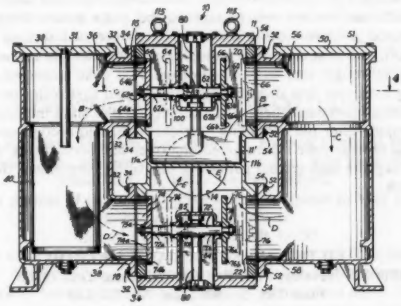
DUPLEX STRAINER

Ashvin D. Desai, and Alvin Bujack, both of Lumberton, N.C., assignors to Mueller Steam Specialty, A Division of Core Industries, Inc., Lumberton, N.C.

Filed Dec. 8, 1983, Ser. No. 559,556

Int. Cl.³ B01D *35/12*

U.S. Cl. 210—341 **3 Claims**



1. A duplex strainer for straining a material supplied under pressure from upstream of the strainer and releasing the

strained material for use downstream of the strainer comprising a housing having an inlet port through which the material enters the housing and an outlet port through which the strained material leaves the housing, a first strainer chamber having first and second ports in separate fluid communication with the housing, a second strainer chamber having a third port which opposes said first port and a fourth port which opposes said second port in separate fluid communication with said housing, a first disk assembly slidably supported on said housing intermediate said first and third ports having a first surface which faces said first port and a third surface which faces said third port, a second disk assembly slidably supported on said housing intermediate said second and fourth ports having a second surface which faces said second port and a fourth surface which faces said fourth port, a first shaft rotatably supported on said housing and extending proximate said first and second disk assemblies, and coupling means for coupling said first shaft to said first and second disk assemblies so that when said first shaft is rotated in a first direction, said first and second disk assemblies are slid towards said first strainer chamber to move said first and second surfaces into engagement with said first and second ports, respectively, to close said first strainer chamber to flow while said third and fourth surfaces are moved away from said third and fourth ports, respectively, to open said second strainer chamber to flow, and when said first shaft is rotated in a second direction, said first and second disk assemblies are slid towards said second strainer chamber to move said third and fourth surfaces into engagement with said third and fourth ports, respectively, to close said second strainer chamber to flow while said first and second surfaces are moved away from said first and second ports, respectively, to open said first strainer chamber to flow, said coupling means including a first yoke means coupled to said first shaft and said first disk assembly for converting the rotation of said first shaft into reciprocal linear movement of said first disk assembly and a second yoke means coupled to said first shaft and said second disk assembly for converting the rotation of said first shaft into reciprocal linear movement of said second disk assembly, said first yoke means including first and second ends, said first end of said first yoke means being coupled to said first shaft for rotation therewith, said second end of said first yoke means being coupled to said first disk assembly for reciprocal lateral displacement therewith, said second yoke means including first and second ends, said first end of said second yoke means being coupled to said first shaft for rotation therewith, said second end of said second yoke being coupled to said second disk assembly for reciprocal lateral displacement therewith, said first and second disk assemblies including first and second disk shafts, respectively, said first disk shaft extending intermediate and coupling said first surface to said third surface, said second disk shaft extending intermediate and coupling said second surface to said fourth surface, said second end of said first yoke means being U-shaped in cross-section and extending over said first disk shaft, said second end of said second yoke means being U-shaped in cross-section and extending over said second disk shaft, said first disk shaft including a first roller pin extending therethrough, said second end of said first yoke means extending over said first disk shaft to capture said first roller pin for rolling movement therewith, said second disk shaft including a second roller pin extending therethrough, said second end of said second yoke means extending over said second disk shaft to capture said second roller pin for rolling movement therewith.

4,496,464

FILTER APPARATUS AND METHOD

Clifford J. Hensley, P.O. Box 6847, Odessa, Tex. 79762

Filed Oct. 3, 1983, Ser. No. 538,140

Int. Cl.³ B01D *23/24*

U.S. Cl. 210—792 **14 Claims**

1. Method of filtering contaminants from a stream of fluid comprising the steps of:

(1) placing a first screen means within a vessel;

(2) placing a filter media upstream of said first screen means and within said vessel, said filter media being made of a multiplicity of discrete pieces of filter material which substantially will not pass through said first screen means;

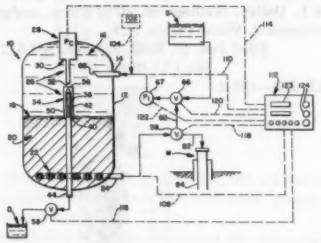
(3) flowing contaminated liquid into the vessel, through the media, through the first screen means, and away from the vessel, while the contaminant is deposited on the media;

(4) cleaning the media of most of the accumulated contaminant while the media predominately remains within the vessel by carrying out the following steps:

(a) placing the suction of a pump in communication with the liquid contained within the vessel;

(b) placing the discharge of said pump within the vessel in spaced relationship respective to said pump suction;

(c) placing a second screen means within said vessel and in spaced relationship respective to said discharge;



(d) flowing contaminated liquid contained within said vessel into said pump suction, through said pump discharge, and across said second screen means at a rate to cause substantially all of the liquid and the media to be agitated with great force, thereby scrubbing the media predominately within said vessel, and causing most of the contaminants to be translocated from the media into the liquid;

(e) discharging the liquid ladened with contaminants through the second screen means and from the vessel while flowing relative uncontaminated liquid into the vessel until most of the suspended contaminants have been removed from the vessel;

(5) reducing the velocity of flow to a value which enables the media to settle into a filter bed;

(6) repeating step (3).

4,496,465

WET-PROCESS PHOSPHORIC ACID BRIGHTENING REAGENT FOR ALUMINUM

Brooks M. Whitehurst, New Bern; Donald F. Clemens, Greenville; Taylor King, Beaufort, and Garnett B. Whitehurst, New Bern, all of N.C., assignors to Whitehurst Associates, Inc. and Encee Chemical Sales, Inc., both of New Bern, N.C., a part interest

Division of Ser. No. 425,573, Sep. 28, 1982,. This application Apr. 27, 1984, Ser. No. 604,463

Int. Cl.³ C09K *13/04, 13/08, 13/06;* **C23F** *1/00*

U.S. Cl. 252—79.2 **4 Claims**

3. A wet process phosphoric acid treating agent comprising about 50–55% P_2O_5 (90–94% con.) about 3% HNO_3 (68–73.5% con.), polyvalent metal cations, Fe^{++}, Fe^{+++}, Al^{+++}, Mg^{++}, and Cu^{++} up to about 3% in Al equivalents and Cu^{++} separately adjusted to positively measure 80–150 ppm.

4,496,466

WET-PROCESS PHOSPHORIC ACID BRIGHTENING REAGENT FOR ALUMINUM

Brooks M. Whitehurst, New Bern; Donald F. Clemens, Greenville; Taylor King, Beaufort, and Garnett B. Whitehurst, New Bern, all of N.C., assignors to Whitehurst Associates, Inc. and Encee Chemical Sales, Inc., both of New Bern, N.C., a part interest

Division of Ser. No. 425,573, Sep. 28, 1982,. This application Apr. 27, 1984, Ser. No. 604,464

Int. Cl.³ C09K *13/04, 13/08, 13/06;* **C23F** *1/00*

U.S. Cl. 252—79.3 **9 Claims**

1. A brightening bath for aluminum derived from a wet-process phosphoric acid consisting essentially of:

(a) a majority amount of orthophosphoric acid;

(b) a subsidiary amount of nitric acid;

(c) trace amounts of SiO_2, chromium, and copper;

(d) trace amounts of fluoride ions sufficient to maintain a phosphorus to fluorine ratio in the range of about 35 to 1 to about 100 to 1;

(e) trace amounts of iron, magnesium, and aluminum sufficient to maintain less than about 3% based on aluminum equivalents of the total dissolved metals in said bath;

(f) less than about 500 ppm organic substances oxidizable in the presence of nitric acid; and

(g) fume inhibitors.

4,496,467

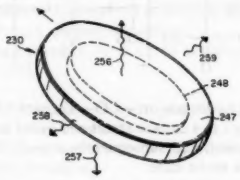
INSECT REPELLENT, PHEREMONAL, ANIMAL REPELLENT DIAGNOSTIC AND/OR AROMA AUGMENTING OR ENHANCING COMPOSITIONS AND ARTICLES CONTAINING AT LEAST A MAJOR PROPORTION OF POLY(EPSILON CAPROLACTONE)HOMOPOLYMERS, AND HAVING IMBEDDED THEREIN ONE OR MORE FUNCTIONAL

Marina A. Munteanu, New York, N.Y.; Edward S. Oltarzewski, Mercerville, N.J.; Leon Shechter, Summit, and Craig B. Warren, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 468,997, Feb. 23, 1983, Pat. No. 4,469,613. This application Dec. 21, 1983, Ser. No. 563,771

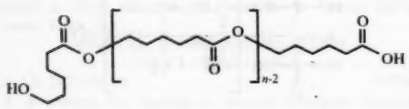
Int. Cl.³ C11D *17/00*

U.S. Cl. 252—92 **2 Claims**

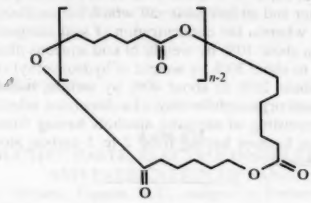


1. A process for the preparation of a detergent bar by augmenting or enhancing the aroma of a void comprising:

(i) the step of placing into said void a scented poly(epsilon caprolactone) homopolymer having the structure:



and from 0 up to a minor proportion of the structure:



wherein n is an integer of from about 500 up to about 1,200 with the proviso that the average n in the system varies from about 600 up to about 800 in the solid phase and imbedded in said polymer an aromatizing agent which is compatible with said polymer and a stablilizing agent;

(ii) surrounding said plastic core and in intimate contact with the surface area of said plastic core, and adhering to said plastic core a detergent composition existing in the solid phase, said detergent composition having a defined outer surface the quantity of aromatizing agent within the plastic core, the physical properties of the plastic core, and the physical properties of the detergent composition surrounding the plastic core being such that the aromatizing agent is transported at a steady state from the plastic core into said detergent composition past the outer surface of said detergent composition and into the environment surrounding said detergent bar, said aromatizing agent being compatible with said detergent composition, said detergent bar being produced by the process consisting essentially of the steps of:

(a) forming a first flowable mass of said poly(epsilon caprolactone) homopolymer in intimate admixture with from 1% up to 30% by weight of aromatizing agent;

(b) casusing the flowable mass to be formed into an extruded rod;

(c) pelletizing the thus formed extruded rod to form pellets in the solid state; have imbedded therein from 1% up to 30% aromatizing agent;

(d) molding the resulting pellets into a functional article internal core for detergent bars; and

(e) placing the functional article into said void;

(f) propelling a detergent composition in the fluid state in such a manner as to cause said detergent to surround the aromatized plastic core; and

(g) causing the detergent composition surrounding the aromatized thermoplastic polymeric core to harden;

the amount of aromatizing agent in said poly(epsilon caprolactone) homopolymer being in the range of from about 1% up to about 30% by weight of the poly(epsilon caprolactone) homopolymer, said poly(epsilon caprolactone) homopolymer containing a stabilizer therefor, the aromatizing agent being transported as a steady state into said void surrounding the thus-produced article.

4,496,468

HYDRATED HYDROXYETHYL CELLULOSE COMPOSITIONS

Roy F. House, Houston, and Lonnie D. Hoover, Chappell Hill, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,672

The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.

Int. Cl.³ C09K *7/02;* **E21B** *43/00*

U.S. Cl. 252—8.5 A **10 Claims**

1. A viscosifying composition which will hydrate in and viscosify heavy brines having a density greater than about 13.5 ppg at ambient temperature which consists essentially of from about 35% to about 55% by weight of an oleaginous liquid which is a liquid aliphatic or aromatic hydrocarbon, from about 0.25% to about 3% by weight based on said oleaginous

liquid of a compatibilizing agent comprising an organophilic clay, from about 15% to about 55% of an aqueous phase comprising water and an inorganic salt which has exothermic heat of solution wherein the concentration of said inorganic salt is greater than about 10% by weight of said aqueous phase, from about 10% to about 30% by weight of hydroxyethyl cellulose, and from about 20% to about 40% by weight, based on the weight of said organophilic clay, of a dispersant selected from the class consisting of aliphatic alcohols having from 1 to 2 carbon atom ketones having from 2 to 5 carbon atoms, and mixtures thereof.

4,496,469
HEAT-INSULATING REFRACTORY MATERIAL CONSISTING ALKALI TITANATE AND SILICON RESIN

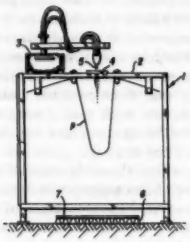
Takuo Morimoto, Kyoto; Kihachiro Nishiuchi, Tokushima; Misao Izumi, Tokushima, and Noriyoshi Ejima, Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Jan. 4, 1983, Ser. No. 455,492

Claims priority, application Japan, Jan. 12, 1982, 57-3625; Jan. 26, 1982, 57-11421; Jan. 26, 1982, 57-11422

Int. Cl.³ C04B *43/02*

U.S. Cl. 252—62 **41 Claims**



1. A heat-insulating refractory material consisting essentially of an alkali titanate and a silicone resin.

4,496,470
CLEANING COMPOSITION

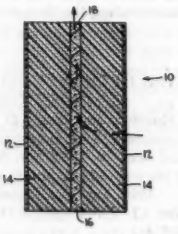
Anita G. Kapiloff, Washington, D.C., and Randolph T. Hatch, Silver Spring, Md., assignors to The B. F. Goodrich Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 224,011, Jan. 12, 1981, Pat. No. 4,357,254. This application Jan. 12, 1982, Ser. No. 338,849

The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.

Int. Cl.³ C02B *5/04*

U.S. Cl. 252—181 **9 Claims**



1. A composition for cleaning solid surfaces in reverse osmosis water purification systems which are fouled with inorganic scale, comprising a 0.1 to 5 percent by weight water solution of a composition consisting essentially of (a) at least one of a monobasic alkali metal or ammonium phosphate; (b) at least one of a dibasic alkali metal or ammonium phosphate; (c) an effective amount of at least one of citric acid, malic acid, or sulfamic acid; and (d) an effective amount of a low-foaming nonionic detergent, and having a pH of from 2 to 4.

4,496,471
STABLE AQUEOUS SOLUTION-TYPE OXIDIZING AGENT COMPOSITION FOR EXPLOSIVES

Yoshikazu Hirosaki, and Katsuhide Hattori, both of Chita, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,738

Claims priority, application Japan, Dec. 10, 1981, 56-197632

Int. Cl.³ C06B *31/28*

U.S. Cl. 252—186.21 **4 Claims**

1. A stable aqueous solution-type oxidizing agent composition consisting of an aqueous solution of an oxidizing agent, which consists of 58–89.99% by weight of ammonium nitrate as a main component and 2–20% by weight of an inorganic chlorate, 8–20% by weight of water and 0.01–2% by weight of a water-soluble inorganic phosphate.

4,496,472
PROCESS FOR BLEACHING CELLULOSIC FIBRE MATERIALS USING OLIGOMERS OF PHOSPHONIC ACID ESTERS AS STABILIZERS IN ALKALINE, PEROXIDE-CONTAINING BLEACHING LIQUORS

Paul Schäfer, Riehen, and Hans-Ulrich Berendt, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

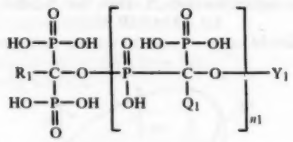
Filed Dec. 17, 1982, Ser. No. 450,718

Claims priority, application Switzerland, Dec. 23, 1981, 8299/81

Int. Cl.³ C09K *3/00*; D06L *3/02*

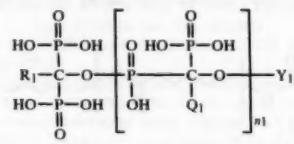
U.S. Cl. 252—186.22 **23 Claims**

1. A process for bleaching cellulosic textile fiber material with an aqueous peroxide-containing alkaline liquor, which process comprises applying to said material a liquor which is stabilized by addition of a water-soluble oligomer of the formula



wherein Y_1 is hydrogen or —CO—T_1, each of R_1, Q_1 and T_1 is alkyl having 1 to 4 carbon atoms and n_1 is 1 to 16, or an alkali metal salt thereof, and subsequently storing the impregnated material in the moist state.

4. An aqueous alkaline peroxide-containing bleaching liquor for carrying out a process for bleaching cellulosic textile fiber material with an aqueous peroxide-containing alkaline liquor, which liquor is stabilized with an oligomer of the formula



wherein Y_1 is hydrogen or —CO—T_1, each of R_1, Q_1 and T_1

is alkyl having 1 to 4 carbon atoms and n_1 is 1 to 16, or an alkali metal salt thereof.

5. The bleaching liquor of claim 4 which contains
(a) an alkali metal hydroxide,
(b) hydrogen peroxide and
(c) the oligomer of claim 4.

6. The bleaching liquor of claim 5 which further contains one or more of
(d) a peroxidisulfate,
(e) a wetting agent,
(f) an antifoaming or deaerating agent,
(g) a water-soluble alkali metal salt of a silicate and
(h) a fluorescent whitening agent.

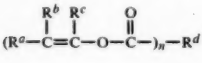
4,496,473

HYDROGEN PEROXIDE COMPOSITIONS

William R. Sanderson, Warrington, England, assignor to Interox Chemicals Limited, London, England

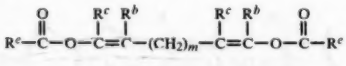
Filed Apr. 12, 1983, Ser. No. 484,209
Claims priority, application United Kingdom, Apr. 27, 1982, 8212149
Int. Cl.³ C11D 7/54
U.S. Cl. 252—186.41 **13 Claims**

1. A liquid composition for use in bleaching or disinfection comprising an emulsion containing an aqueous acidic solution of hydrogen peroxide, an organic phase and an emulsifying amount of an emulsifier, said organic phase comprising an enol ester activator having either of the following general formulae:



(i)

or



(ii)

in which
each of R^a and R^b represent hydrogen or a C_1 to C_5 alkyl radical or a C_2 to C_4 alkenyl radical or a phenyl radical, R^a and R^b being the same or different or combining together to form a carbocyclic di-radical,
R^c represents hydrogen or a C_1 to C_5 alkyl radical or a phenyl radical or is combined with R^a or R^b and the olefin group to form a carbocyclic radical,
R^e represents hydrogen or a C_1 to C_3 alkyl radical or a phenyl radical,
n is 1 or 2,
when n=1, R^d represents hydrogen or a C_1 to C_3 alkyl radical or a phenyl radical,
when n=2, R^d represents a C_2 to C_{10} alkylene di-radical or a phenylene di-radical,
and m is an integer from 0 to 8.

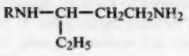
4,496,474

ASPHALT EMULSIONS COMPRISING N-ALIPHATIC-1,3-DIAMINOPENTANE EMULSIFIER AND PROCESS

Richard A. Reck, Hinsdale, Ill., assignor to Akzona Incorporated, Enka, N.C.

Filed Dec. 20, 1982, Ser. No. 451,639
Int. Cl.³ B01J 13/00
U.S. Cl. 252—311.5 **2 Claims**

1. A process for making an asphalt emulsion comprising emulsifying bitumen in water in the presence of an emulsifier of the formula:



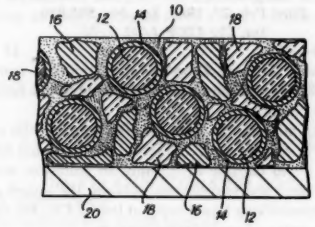
wherein R is tallow.

4,496,475

CONDUCTIVE PASTE, ELECTROCONDUCTIVE BODY AND FABRICATION OF SAME

John C. Abrams, Tappan, N.Y., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.

Division of Ser. No. 187,428, Sep. 15, 1980, Pat. No. 4,419,279. This application Sep. 1, 1982, Ser. No. 413,608
Int. Cl.³ H01B 1/06
U.S. Cl. 252—514 **14 Claims**



1. A conductive paste suitable for forming an electroconductive body, which comprises inorganic non-metallic particles coated with silver, said silver-coated inorganic non-metallic particles being of a size, on average, of from 1 to 100 microns in maximum dimension, silver particles and particles of glassy material, said particles of glassy material having a fusion silver-coated glass beads, in an inert organic vehicle which is substantially eliminated from the remaining components of the conductive paste during formation of the electroconductive body, the total amount of silver in said paste constituting at least 10% by weight of the paste and the amount of silver in said silver particles constituting at least 5% by weight of the paste.

4,496,476

ODORANTS CONTAINING CIS-3,7-DIMETHYLOCTA-3,6-DIENOIC ACID

Peter Naegeli, Wettingen, Switzerland, and Martin Rohr, Glen Rock, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Aug. 23, 1982, Ser. No. 410,296
Claims priority, application Switzerland, Sep. 9, 1981, 5823/81
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R **6 Claims**

1. A fragrance composition comprising an olfactorily effective amount of cis-3,7-dimethylocta-3,6-dienoic acid and at least one other olfactory agent.

4,496,477

APPARATUS AND A PROCESS FOR HEATING A MATERIAL

Donald R. Ross, P.O. Box 11388, Fort Worth, Tex. 76110

Division of Ser. No. 787,713, Apr. 14, 1977, Pat. No. 4,263,163. This application Mar. 5, 1980, Ser. No. 127,452
Int. Cl.³ G21F 9/16
U.S. Cl. 252—629 **8 Claims**

1. A process for treating readioactive material, said process comprising:
a. mixing said radioactive material with an expandable solid particle to form a mixture;

b. heating said mixture to expand and to encapsulate said radioactive material to form encapsulated material;
c. in heating said mixture burning fuel in the presence of said mixture to heat said mixture to assist in forming said encapsulated material;
d. contacting said mixture with a hot surface to assist in forming said encapsulated material;
e. reflecting heat energy radiating from said hot surface toward said mixture on said hot surface to assist in forming said encapsulated material; and,
f. said encapsulated material being a solid.

4,496,478

PROCESS FOR SEPARATING UNSAPONIFIABLES FROM FATTY AND ROSIN ACIDS

Sudhir S. Kulkarni, and Santi Kulprathipanja, both of Hoffman Estates, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 27, 1984, Ser. No. 584,030
Int. Cl.³ C09F *1/00, 5/10*
U.S. Cl. 260—97.6 **11 Claims**

1. A process for separating an unsaponifiable compound from a feed mixture comprising a fatty acid and a rosin acid, said process comprising:
(a) forming an emulsion with said feed mixture, an organic solvent in which said feed mixture is soluble and an emulsifying liquid capable of forming an emulsion with said feed mixture and said organic solvent, the polarity index of said emulsifying liquid being at least 2.4 higher than the polarity index of said organic solvent;
(b) effecting the formation of three phases from said emulsion, an organic solvent phase containing the major portion of said fatty acid and rosin acid, an emulsifying liquid phase and a semi-solid sludge phase containing the major portion of said unsaponifiable compound; and
(c) separating the three phases.

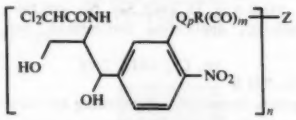
4,496,479

CHLORAMPHENICOL DERIVATIVES, ANTIGENS AND ANTIBODIES

Mae W. Hu, and Prithipal Singh, both of Sunnyvale, Calif., assignors to Syntex (U.S.A.) Company, Palo Alto, Calif.

Filed May 18, 1983, Ser. No. 495,851
Int. Cl.³ A61K *31/04*
U.S. Cl. 260—112 R **15 Claims**

1. A compound of the formula:



wherein:
Q is chalcogen of atomic number 8 to 16 or nitrogen;
p is 0 or 1;
R is a linking group of at least 1 carbon atom and not more than 12 atoms other than hydrogen;
Z is hydrogen, hydroxy, alkoxy of from 1 to 6 carbon atoms, a group forming an activated ester capable of amide formation in an aqueous medium, or a poly(amino acid) which is antigenic or an enzyme;
m is 0 or 1 when Z is a poly(amino acid) and is otherwise 1; and
n is 1 when Z is other than a poly(amino acid) and is otherwise a number between one and the molecular weight of Z divided by 1000.

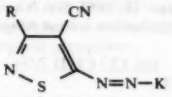
4,496,480

ISOTHIAZOLAZO DYES HAVING COUPLING COMPONENTS WHICH ARE FREE FROM UNSATURATED ALIPHATIC RADICALS

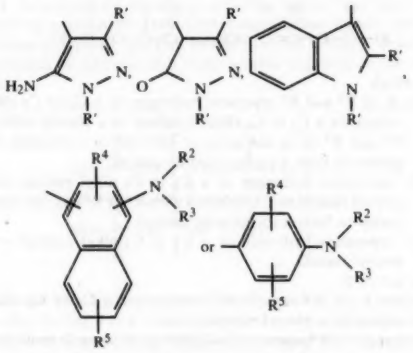
Udo Bergmann, Darmstadt; Johannes P. Dix, Neuhofen; Guenter Hansen, and Ernst Schefczik, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 463,001
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207209
Int. Cl.³ C09B *29/039, 29/08, 29/095, 29/36*
U.S. Cl. 534—794 **9 Claims**

1. An isothiazolazo dye of the formula:



wherein R is a C_1–C_4 alkyl which is substituted by chlorine, bromine, cyano, hydroxyl, C_1–C_4-alkoxy, phenoxy, C_1–C_8-alkoxycarbonyl or an unsubstituted phenyl or a phenyl substituted by methyl, chloro, bromo, methoxy, ethoxy or nitro; and K is



wherein R^1 is hydrogen, alkyl, aralkyl, aryl or aryl substituted by chlorine, R^2 is hydrogen or R^3, R^3 is C_1–C_6 alkyl or C_1–C_6 alkyl substituted by chlorine, bromine or hydroxyl, C_1–C_8 alkoxy, phenoxy, cyano, carboxyl, C_1–C_8-alkanoyloxy, benzoyloxy, o-, m-, and p-methylbenzoyloxy, o-, m- and p-chlorobenzoyloxy, C_1–C_4-alkoxyalkanoyloxy, phenoxyalkanoyloxy, C_1–C_8-alkoxycarbonyloxy, C_1–C_8-alkoxyalkoxycarbonyloxy, benzyloxycarbonyloxy, phenethyloxycarbonyloxy, phenoxyethoxycarbonyloxy, C_1–C_8-alkylaminocarbonyloxy, cyclohexylaminocarbonyloxy, phenylaminocarbonyloxy, C_1–C_8-alkoxycarbonyl, C_1–C_8-alkoxyalkoxycarbonyl, phenoxycarbonyl, benzyloxycarbonyl or phenethyloxycarbonyl, or phenyl, benzyl, phenylethyl and cyclohexyl; and R^4 and R^5 are hydrogen, alkyl, alkoxy, phenoxy, halogen, alkylsulfonylamino, dialkylaminosulfonylamino or acylamino.

4,496,481
PRODUCTION OF AZO COMPOUNDS

Ian R. Wheeler, Houston, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,860
Claims priority, application United Kingdom, Dec. 23, 1980, 8041277
Int. Cl.³ C09B 29/32
U.S. Cl. 534—579 10 Claims

1. In an improved process for the production of an azo compound in one step by the simultaneous diazotisation and coupling with agitation of a mixture of a diazotisable amine, a coupling component and an organic or inorganic nitrite, each dissolved or dispersed in a water-insoluble liquid organic acid in the absence of any other solvent component, at a temperature of −20° to 100° C., the improvement comprises

carrying out the reaction in a straight or branched-chain alkanoic acid of 4 to 10 carbon atoms or in a mixture of said acids,

adding to the reaction mixture, after reaction is complete, sufficient aqueous alkali to convert said alkanoic acid to its water-soluble alkaline salt which is transferred into the aqueous phase, from which the free alkanoic acid is recovered, for eventual recycle in the process, by subsequent acidification of the aqueous phase of pH 4 with mineral acid to form a two-phase system from whence the free acid is recovered in high yield as the organic phase by gravitational or centrifugal means, and

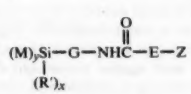
isolating the insoluble azo compound from the resultant mixture.

4,496,482
LIQUID CRYSTAL SILANES

George E. Totten, West Haverstraw, N.Y., and Thomas C. Williams, Ridgefield, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

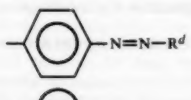
Division of Ser. No. 122,482, Feb. 19, 1980, Pat. No. 4,316,041. This application Oct. 22, 1981, Ser. No. 313,796
Int. Cl.³ C09B 29/08; C07J 9/00
U.S. Cl. 534—577 20 Claims

1. A liquid crystal compound of the general formula



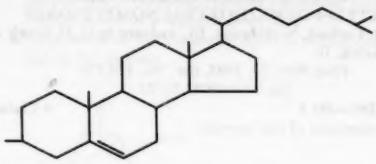
(I)

wherein y is an integer having a value of from 1 to 3; x is an integer having a value of from 0 to 2; M is methoxy, ethoxy, chloro or dimethylamino; R′ is hydrogen, methyl or ethyl; G is alkylene having from 2 to 4 carbon atoms, or arylene or aralkylene having from 6 to 8 carbon atoms; E is —O— or —NH—; and Z is a group of the formula:



(A)

-continued



(B)

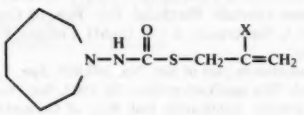
wherein R^d is an unsubstituted or substituted phenyl, naphthyl or anthracenyl group; wherein the substituents on said groups can be chloro, nitro, methylthio, bromo, iodo, tertiary amino, acyl having from 2 to 12 carbon atoms, dialkylamino in which the alkyl group has from 1 to 5 carbon atoms, alkoxy having from 1 to 6 carbon atoms, alkyl having from 1 to 10 carbon atoms, cyano, esters which may contain substituted aryl or aralkyl moieties of from 1 to 12 carbon atoms or carbonates containing an alkyl group of from 1 to 10 carbon atoms.

4,496,483
N-HEXAMETHYLENEIMINO THIOLCARBAMATE COMPOUNDS

Don L. Hunter, Anaheim, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Sep. 12, 1983, Ser. No. 531,139
Int. Cl.³ A01N 47/12; C07D 295/00
U.S. Cl. 260—239 BF 5 Claims

1. Thiolcarbamates of the formula



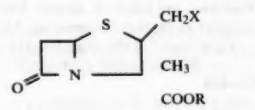
wherein X represents halogen.

4,496,484
PENICILLIN DERIVATIVES

Ronald G. Micetich, Sherwood Park, Canada; Shigeru Yamabe, Kobe, Japan; Shoji Hirata, Matsudo, Japan, and Naobumi Ishida, Tokushima, Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,557
Int. Cl.³ C07D 499/00; A61K 31/425
U.S. Cl. 260—245.2 R 8 Claims

1. A penicillin derivative represented by the following formula and alkali metal, alkaline earth metal, cyclohexylamine, trimethylamine, diethanolamine, alginine, lysine or ammonium salts thereof



wherein X represents chlorine atom or bromine atom, and R represents hydrogen atom, C_{1-6} alkyl, C_{1-6} alkyl substituted with 1 to 3 halogen atoms, methyl group substituted with 1 to 3 phenyl groups which may optionally be substituted with methoxy or nitro on the phenyl ring, C_{1-6} alkoxymethyl, C_{1-6} alkylcarbonyloxy-C_{1-6} alkyl, (C_{5-7} cycloalkyl)carbonyloxy-C_{1-6} alkyl, benzylcarbonyloxy-C_{1-6} alkyl, benzoyloxy-C_{1-6} alkyl, phthalidyl, tetahydropyranyl, 5-oxo-2-tetrahydrofuranyl, dimethylaminoethyl, dimethylchlorosilyl or trichlorosilyl.

4,496,485

ASYMMETRIC 7-O-(SUBSTITUTED ACETYL)-4-DEMETHOXYDAUNOMYCINONES

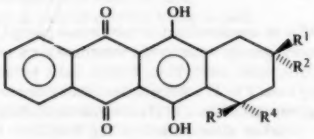
Robert B. Garland, Northbrook, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Nov. 25, 1983, Ser. No. 555,270

Int. Cl.³ C07C *50/27*

U.S. Cl. 260—351.1 **4 Claims**

1. A compound of the formula:



wherein one of R^1 or R^2 is acetyl and the other is hydroxy;
wherein one of R^3 and R^4 is hydrogen and the other is $O(CO)CH_2OR^5$;
wherein the hydroxy and the $O(CO)CH_2OR^5$ are in a cis relationship; and
wherein R^5 is an asymmetric radical selected from the group consisting of 1-menthyl, d-menthyl, 1-isomenthyl, d-isomenthyl, d-neomenthyl, bornyl and 1-isopinocamphyl.

4,496,486

METHOD FOR THE PREPARATION OF PHOSPHATIDYL CHOLINE OF LOW OIL CONTENT

Bernd-Rainer Günther, Bergheim, Fed. Rep. of Germany, assignor to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 269,805, Jun. 3, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,480

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023814

Int. Cl.³ A23J *7/02;* **C07F** *9/10*

U.S. Cl. 260—403 **10 Claims**

1. A method for the preparation of a substantially oil-free phosphatidyl choline fraction from an oil-containing phosphatide fraction comprising admixing a solution comprised of an alcohol and an oil-containing phosphatide resulting from the alcohol extraction of said phosphatide with between about 10 and 20 percent by volume of water based on said solution to cause oil present therein to separate from said solution, removing said oil from said solution and recovering a substantially oil-free phosphatidylcholine fraction from said solution.

4,496,487

HYDROXYMETHYL POLYOLS

Dwight E. Peerman, and Edgar R. Rogier, both of Minnetonka, Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Sep. 7, 1982, Ser. No. 415,718

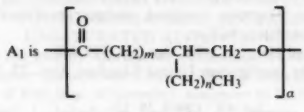
Int. Cl.³ C09F *5/00, 7/00*

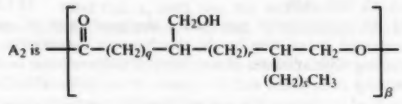
U.S. Cl. 260—404 **44 Claims**

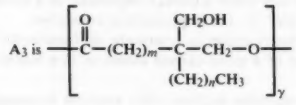
1. Non-gelling polyols of the formula:

$$R—X—A—H]_p$$

where
R is a polyol, polyamine or aminoalcohol residue;
X may be the same or different and is O, N or NH;
p is an integer from 2 to 6; and,
A may be the same or different and is selected from the group consisting of A_1, A_2 and A_3 and combinations of A_1, A_2 and A_3, where







where m, n, q, r, s, α, β and γ are integers and where
$m > 3$
$n \geqq 0$ and
$m+n$ is from 11 to 19
$q > 3$
$r \geqq 0$
$s \geqq 0$ and
$q+r+s$ is from 10 to 18
α is from 0 to 10
β is from 0 to 10 and
γ is from 0 to 10, except that all α's, β's and γ's in any given compound are not all zero; with the proviso that when X is oxygen, p is 3, A is A_1 and each α is 1, R is not glycerol.

4,496,488

COPPER AND MANGANESE REMOVAL FROM C_6-C_9 SATURATED ALIPHATIC MONOCARBOXYLIC ACIDS

Clarence J. Duey, Jr., Bay City, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,568

Int. Cl.³ C11C *1/00*

U.S. Cl. 260—413 **4 Claims**

1. A process for removing cupric and manganous metal ions from a saturated aliphatic monocarboxylic acid containing from 6 to 9 carbon atoms comprising adding to said monocarboxylic acid, water and a mineral acid whose hydrogen can be replaced by said cupric and manganous metal ions, said extractant acid being present in an amount sufficient to extract said cupric and manganous metal ions in soluble form from said monocarboxylic acid into an aqueous layer; said monocarboxylic acid collecting in a water-immiscible organic phase and said metal ions collecting in an aqueous phase, separating said organic phase from said aqeous phase and recovering said monocarboxylic acid having a substantially reduced content of said cupric and manganous metal ions.

4,496,489

SEPARATION PROCESS AND PRODUCTS OBTAINED THEREBY

Achintya K. SenGupta, Schenefeld, Fed. Rep. of Germany, assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 1, 1981, Ser. No. 307,472

Claims priority, application United Kingdom, Oct. 2, 1980, 8031784

Int. Cl.³ C09F *5/10;* **C11B** *3/00*

U.S. Cl. 260—428.5 **15 Claims**

1. A process for the fractionation of mixtured containing phosphatides in a solution of said mixtures in a solvent system in which selective micelles formation occurs, which comprises an essentially non-polar solvent and a polar solvent which comprises the steps of:

(a) contacting said solution with a semipermeable membrane under-pressure;
(b) separating said solution into a permeate portion and a retentate portion, and
(c) recovering by solvent removal a fraction enriched in at least one of the component phosphatides from one of the portions separated by the semipermeable membrane.

4,496,490

NON-TOXIC ORGANOTIN STABILIZERS FOR VINYL CHLORIDE POLYMERS

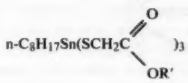
William A. Larkin, Morristown, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 43,997, May 31, 1979, abandoned, which is a continuation of Ser. No. 454,363, Mar. 25, 1974, abandoned, which is a division of Ser. No. 343,648, Mar. 22, 1973, abandoned. This application Feb. 12, 1980, Ser. No. 120,753

Int. Cl.³ C07F 7/22

U.S. Cl. 260—429.7 **4 Claims**

1. A food grade liquid organotin stabilizer for polyvinyl chloride and copolymers of vinyl chloride with copolymerizable ethylenically unsaturated compounds, wherein said stabilizer consists essentially of between 95 and 100% by weight of mono-n-octyltin compound of the general formula



wherein R′ represents an alkyl radical containing eight carbon atoms, the remaining 0–5% of said stabilizer consisting essentially of other octyltin compounds.

4,496,491

AROMATIC DIISOCYANATES CONTAINING N,N-DISUBSTITUTED SULFONAMIDE GROUPS AND PROCESSES FOR THEIR PRODUCTION

Richard Kopp, Cologne; Gerhard Grögler, Leverkusen; Helmut Reiff, Leverkusen, and Dieter Dieterich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

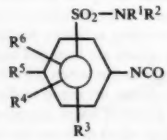
Filed Jul. 22, 1982, Ser. No. 401,036

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130844

Int. Cl.³ C07C 119/048

U.S. Cl. 260—453 AR **3 Claims**

1. A diisocyanate corresponding to the general formula

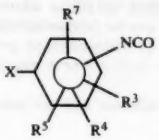


in which

R^1 and R^2 (which may be the same or different) each represent an alkyl radical containing from 1 to 18 carbon atoms, an aryl radical containing from 6 to 10 carbon atoms, a cycloalkyl radical containing from 3 to 7 carbon atoms, an aralkyl radical containing from 7 to 15 carbon atoms or an alkaryl radical containing from 7 to 15 carbon atoms or, together with the nitrogen atom, form a 3-membered to 10-membered heterocyclic ring optionally containing further heteroatoms;

R^3, R^4 and R^5 (which may be the same or different) each represent hydrogen, an alkyl radical containing from 1 to 6 carbon atoms, an aryl radical containing from 6 to 10 carbon atoms, a cycloalkyl radical containing from 3 to 7 carbon atoms, an aralkyl radical containing from 7 to 15 carbon atoms, an alkaryl radical containing from 7 to 15 carbon atoms or a halogen atom; and

R^6 represents an isocyanate group or a radical corresponding to the formula



in which

R^7 represents hydrogen or a radical corresponding to the formula

and X represents a methylene or a dimethyl methylene group.

4,496,492

SUBSTITUTED PHENYLALKYL COMPOUNDS

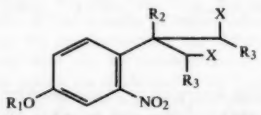
Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 346,642, Feb. 8, 1982, abandoned, which is a division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Jul. 19, 1983, Ser. No. 515,434

Int. Cl.³ C07C 143/68

U.S. Cl. 260—456 R **2 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of $—CH_3$, $—CH_2Ph$, $CH_2{=}CHCH_2—$, $—CH_2SCH_3$, $—CH_2OCH_3$, $—CH_2OCH_2CH_2OCH_3$, $—CH_2CCl_3$, and $—CH_2CH_2Si(R_2)_3$; R_2 and R_3 are hydrogen, alkyl of from 1 to 5 carbon atoms inclusive and phenyl; and X is selected from the group consisting of OSO_2R_2, Cl, Br and I with the proviso that R_2 in the OSO_2R_2 moiety is other than hydrogen.

4,496,493

PHOSPHOROUS ESTERS OF CYANOHYDRINS

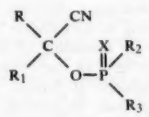
Leonard E. Hodakowski, Raleigh, and Hafez M. Ayad, Cary, both of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 169,284, Jul. 10, 1980, abandoned. This application Apr. 16, 1982, Ser. No. 369,307

Int. Cl.³ C07F 9/165; A01N 57/12, 57/16

U.S. Cl. 260—940 **8 Claims**

1. Compounds of the formula:



wherein X is O or S;

R and R_1 are the same or different and are independently

hydrogen, lower alkyl (C_1–C_{15}), whereby C_3–C_{15} can be branched or unbranched, and wherein the alkyl chain can be substituted or unsubstituted with alkylthio, alkoxy, or one or more halo; cycloalkyl (C_3–C_8), alkenyl, phenyl, benzyl, pyridinyl, naphthalene, all of which may be optionally substituted with one or more halogen, nitro, cyano, allyloxy trihalomethyl, alkyl, alkylthio, alkoxy, or aryloxy, aryloxy alkyl, which can be further substituted with alkoxy, halogen, alkyl, or trihalomethyl groups; taken together R and R_1 may form a 5 or 6 membered carbocyclic ring,

R_2 and R_3 can be the same or different and are independently:

(a) alkylthio (C_1–C_8), and

(b) alkoxy (C_1–C_8) with the proviso that R_2 and R_3 may not be alkoxy at the same time.

4,496,494

PROCESS FOR PREPARATION OF (HALO)(HYDROXY)-SUBSTITUTED PHOSPHITES AND PHOSPHORATES

Chester E. Pawloski, Bay City, and Sally P. Ginter, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 250,449, Apr. 2, 1981, Pat. No. 4,365,026. This application Jun. 15, 1982, Ser. No. 388,786

Int. Cl.³ C07F 9/11, 9/14

U.S. Cl. 260—977 **2 Claims**

1. A process for forming esters of phosphorus-containing acids containing at least one hydroxyl- and halogen-containing alkyl ester functionality comprising reacting at least one phosphorus-containing compound of the formula

$$R'''_n\text{—}\overset{\overset{O}{\|}}{P}\text{—}X_{3-n},\ R'''_n\text{—}P\text{—}X_{3-n} \text{ or } PX_5$$

wherein:

X is halo,

R''' is a moiety having up to 10 carbons selected from the group consisting of alkyl, aryl, haloalkyl, haloaryl, alkoxy and haloalkoxy; and

n is a number greater than or equal to zero and less than three,

with one or more non-hydroxyl-containing epoxy compounds provided that at least one of the epoxy compounds is capable of forming dealkylatable ring-opened reaction products; and subsequently dealkylating the reaction product to produce an ester of phosphorus-containing acids having both hydroxy and halogen moieties in at least one ester moiety.

4,496,495

STABILIZATION OF PHOSPHORODITHIOIC ACID DIESTERS

Gunter J. Caspari, Wheaton, and Steven E. Lindberg, Wheatland Township, Will County, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 12, 1983, Ser. No. 457,450

Int. Cl.³ C07F 9/165

U.S. Cl. 260—989 **20 Claims**

1. A method for stabilizing a phosphorodithioic acid diester which comprises adding to said diester a stabilizer which is selected from the group consisting of ammonia, ammonium carbonate, ammonium salts of carboxylic acids, the oxides, hydroxides and carbonates of lithium, sodium, potassium, rubidium, cesium, berylium, magnesium, calcium, strontium and barium, and mixtures thereof, wherein the amount of said stabilizer is effective to increase the thermal stability of the phosphorodithioic acid diester.

4,496,496

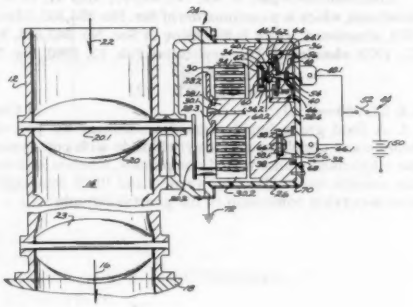
FUEL SUPPLY SYSTEM WITH ELECTRIC CHOKE AND CONTROL THEREFOR

Hidde Walstra, Almelo, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 1, 1982, Ser. No. 437,982

Int. Cl.³ F02M 1/12

U.S. Cl. 261—39 E **6 Claims**

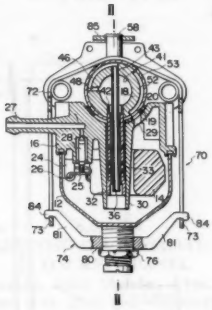


1. A fuel supply system for an automotive engine comprising a carburetor having an air-fuel induction passage for providing a mixture of air and fuel to the engine, an unbalanced-mounted air-movable choke valve mounted for movement across the passage to regulate air-flow into the passage, thermally responsive spring means operatively connected to the choke valve and movable in response to increase in temperature of the thermally responsive spring means for biasing the choke valve toward a position restricting air-flow into the passage with a force which decreases over a selected force range in response to increase in the temperature of the thermally responsive spring means over a selected temperature range, electrical heating means operable on initiation of engine operation for heating the thermally responsive spring means, and electrical control means for regulating operation of the heater means, characterized in that, the control means comprise movable and complementary contact means connectable between a power source and the heater means for activating at least a portion of the heater means when the contact means are engaged and for deactivating said portion of the heater means when the contact means are separated, and bimetallic means arranged to dispose the contact means in said engaged position when operation of the engine is initiated to provide a fast initial decrease in choke valve biasing force to enhance fuel use by the engine, to respond to heating thereof to move the contact means to said separated position with a delay after initiation of operation of the heater means for providing a subsequent period of relatively slower decrease in choke valve biasing force as the thermally responsive spring means is heated over a first part of said selected temperature range to provide improved engine driveability during engine warm up, and to be further operable in response to further heating thereof for returning the contact means to said engaged position to reactivate said portion of the heater means to provide a relatively faster decrease in choke valve biasing force over a final part of said selected force range for enhancing fuel use by the engine after suitable engine driveability has been assured by the engine warm up.

4,496,497
CARBURETOR ASSEMBLY

Yoichi Satoh, Zama, Japan, assignor to Nippon Carburetor Co., Ltd., Tokyo, Japan

Filed May 19, 1983, Ser. No. 496,183
Claims priority, application Japan, May 27, 1982, 57-88903
Int. Cl.³ F02M *3/08*
U.S. Cl. 261—41 D 3 Claims

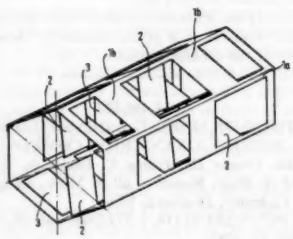


1. A carburetor assembly comprising an air intake pipe having a venturi section therein, an outer cylindrical body in which said air intake pipe is inserted, a float chamber, a cover for said float chamber, the outer wall of said air intake pipe having a plurality of grooves therein forming fuel and air passages, a main nozzle member for communicating said venturi section with said float chamber, a fuel pipe inserted into said main nozzle member, and a clamping means for securing said outer cylindrical body, said cover for the float chamber and said float chamber in assembled relation.

4,496,498
STATISTICAL PACKING

Raymond Pluss, Klein-Andelfingen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 14, 1982, Ser. No. 398,187
Claims priority, application Switzerland, Jul. 30, 1981, 4928/81
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—95 9 Claims

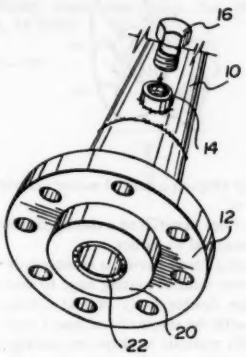


1. A statistical packing having a peripheral wall defining a polygonal shape, a plurality of tongues extending inwardly of said wall to define gaps in said wall, a plurality of apertures in said wall disposed circumferentially of said tongues and gaps, and solid surface portions disposed circumferentially of said tongues and apertures, said packing having a length greater than the diameter thereof.

4,496,499
PROCESS FOR LINING HIGH PRESSURE PIPELINE

Perry N. Brittain, 711 Willamette Dr., SE., and John D. Kirkpatrick, Suite 2008, 1200 6th St. SW., both of Calgary, Alberta, Canada

Continuation-in-part of Ser. No. 115,488, Jan. 25, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,498
Int. Cl.³ B29C *17/07*; B32B *31/04*
U.S. Cl. 264—36 11 Claims



1. A method of lining a section of a high pressure pipeline which utilizes the structural strength of the pipeline to enable the lined pipeline section to be operated at high pressure, said section including first and second pipe flanges disposed at opposite ends thereof, the method comprising:

(a) providing a plastic liner having:

(i) a wall thickness and composition such that the liner is firm and self-sustaining in tubular form;

(ii) an outside diameter sufficiently less than the inside diameter of the pipeline to enable drawing the liner through the pipeline section, but sufficiently large so that the liner can be non-destructively radially expanded against the inside wall of the pipeline;

(b) drawing the liner in non-collapsed condition into the pipeline section by pulling the liner from one end area thereof through the pipeline section until the liner is substantially longitudinally co-extensive with the pipeline section;

(c) before concluding said drawing step, affixing a first liner flange to the end of said liner segment opposite said one end area;

(d) completing the drawing step to position said first liner flange against said first pipe flange;

(e) longitudinally stretching the liner within the pipeline section by elongating said liner without exceeding the elastic limit of the liner by pulling said one end area of the liner beyond the length of the pipeline section while said first liner flange prevents longitudinal movement of the opposite end of said liner along the pipeline section;

(f) after said stretching step, affixing a second liner flange to said one end area of said liner segment opposite said first liner flange;

(g) positioning said second liner flange against said second pipe flange by permitting the liner to elastically retract into the pipeline section;

(h) opening at least one bleeding port in the pipeline section;

(i) radially expanding the liner against the inside wall of the pipeline to an extent to permanently change the liner outside diameter from its original size to a size conforming to the inside diameter of the pipeline;

(j) during step (i), bleeding the space between the liner and the pipeline through the bleeding port; and

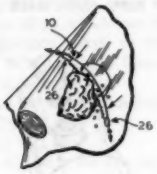
(k) closing the bleeding port.

4,496,500

METHOD FOR VEHICLE BODY SHAPING

Alexander Haber, 2296 Rockwood Ave., Baldwin, N.Y. 11510

Filed Mar. 28, 1983, Ser. No. 479,479
Int. Cl.³ B29C *23/00*
U.S. Cl. 264—36 **4 Claims**



1. A method for shaping a curved motor vehicle panel comprising the steps of:

applying body filler material to a damaged panel area;

allowing said material to harden

applying a cutting blade having a substantially flat flexible body and a saw-toothed cutting edge to said panel;

bending the flat flexible body of said cutting blade into conformity with the shape of said panel; and

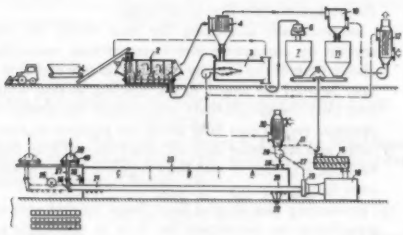
cutting said filler material to shape by moving said cutting blade across said material while applying firm back and forth strokes.

4,496,501

PROCESS AND APPARATUS FOR THE PRODUCTION OF ARTICLES CONSISTING OF CERAMIC MATERIAL

Walter Linke, Mauerbach; Peter Kirnbauer, Brunn, and Rudolf Indra, Vienna, all of Austria, assignors to Wienerberger Baustoffindustrie Aktiengesellschaft, Vienna, Austria

Filed Dec. 21, 1982, Ser. No. 451,898
Claims priority, application Austria, Dec. 22, 1981, 5520/81; Nov. 17, 1982, 4194/82
Int. Cl.³ B29H *19/00*
U.S. Cl. 264—37 **32 Claims**



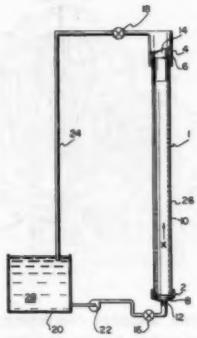
1. A process for producing plural articles made of a ceramic material, comprising the steps of: extruding a starting material which has a plastic consistency and contains clay so as to form an elongate string having a longitudinal channel therethrough; drying, firing and cooling said string, including the step of causing a stream of a gas to flow through said longitudinal channel in said string in a predetermined direction; and dividing said string into a plurality of said articles.

4,496,502

METHOD OF GELLING A GELATION SHRINKABLE, POLYMER CASTING SOLUTION

Oleh Kutowy, North Gover; William L. Thayer, and Srinivasa Sourirajan, both of Ottawa, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Feb. 10, 1983, Ser. No. 465,548
Claims priority, application Canada, Mar. 31, 1982, 400321
Int. Cl.³ B29D *27/04*
U.S. Cl. 264—41 **6 Claims**



1. A method of gelling a gelation shrinkable, polymer casting solution that has been cast on the internal surface of a tubular support, comprising:

(a) supporting the tubular support with the gelation shrinkable, polymer casting solution cast on the internal surface thereof and the outer surface thereof exposed to atmosphere, and

(b) pumping gelation liquid along the interior of the tubular support from the lower end thereof at a velocity in the range of the order of 10 to 100 cm/sec, and at a pressure of at least kPs gauge, to cause pressure gelation of the cast polymer solution at all points of contact between the gelation liquid and the cast polymer solution, the gelation liquid being pumped along the tubular support at least until substantially all of the polymer of the casting solution is gelled to form a semipermeable membrane, whereby

the formation of pockets between the cast polymer solution therein and the tubular support is avoided, and

the asymmetricity of the pore structure of the membrane, when viewing the membrane cross-section, is achieved by gelling the cast polymer solution outwardly from the inner surface thereof, and

the cast polymer solution is continuously in contact with the tubular support as a gelled membrane along the whole length of the tubular support.

4,496,503

METHOD OF MAKING A DENSIFIED SILICON NITRIDE/OXYNITRIDE COMPOSITE

Andre Ezis, Grosse Ile; Elaine C. Beckwith, Riverview, and Howard D. Blair, Romulus, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01114, § 371 Date Jul. 19, 1983, § 102(e) Date Jul. 19, 1983
PCT Filed Jul. 19, 1983, Ser. No. 527,911
Int. Cl.³ C04B *35/32*
U.S. Cl. 264—56 **13 Claims**

1. A method of making a densified silicon nitride comprising object, by the steps of:

(a) shaping a substantially homogeneous powder mixture of silicon nitride and yttrium silicon oxynitride, the latter being present in an amount sufficient to form a viscous solution with at least a portion of said silicon nitride dur-

ing fusion heating, said shaping being carried out to form an object of less than required dimension and density; and

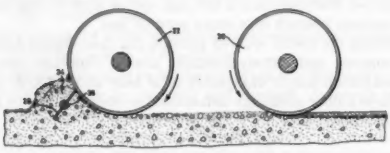
(b) densifying said shaped body by heat fusion, with or without the use of mechanical pressure, to constitute an object of required density and dimension.

4,496,504

METHOD OF EXPOSING AGGREGATE IN A POURED CONCRETE PANEL

Thomas W. Steenson, 408A Marybay Cres., Richmond Hill, Ontario, Canada (L4C 2X4), and William D. Paton, 14 Steeplechase Ave., Aurora, Ontario, Canada (L4G 3G8)

Filed Jun. 29, 1983, Ser. No. 508,737
Int. Cl.³ B28B *3/12*
U.S. Cl. 264—69 **2 Claims**



1. A method of making a cast concrete panel with coarse aggregate exposed on its upper face as cast comprising the steps of:

pouring and compacting wet concrete having a coarse aggregate content into a casting bed;

leveling the upper surface of the concrete to the desired height by means that includes the passage thereover of a screed roller rotating in a direction to push excess surface concrete in advance of the screed roller;

lifting coarse aggregate towards the upper surface of the concrete in advance of the screed roller by passing the free ends of rotating aggregate lifter arms through the concrete, the aggregate lifterarms being spaced apart a distance to support coarse aggregate therebetween, whereby to lift and concentrate coarse aggregate in the wet concrete towards the surface, and to deposit a high concentration of coarse aggregate in front of said screed roller, said aggregate lifter arms being mounted radially of a rotating shaft that rotates in the opposite direction to the direction of rotation of the screed roller;

compacting the concentrated coarse aggregate to leave cement and fine aggregate as an overlay to the compacted coarse aggregate by the passage over the surface layer of a compacting roller that is rotated in the opposite direction to the screed roller with respect to the direction of travel of roller rotation along the casting bed to compact coarse aggregate and deposit cement and fine aggregate as an overlay as aforesaid;

permitting the body of the concrete to cure; and

exposing the coarse aggregate on the upper face by removing cement and fine aggregate from between the coarse aggregate to expose the coarse aggregate on the flat upper surface of the panel as cast.

4,496,505

PROCESS FOR THE PRODUCTION OF A POLYESTER FIBER DYEABLE UNDER NORMAL PRESSURE

Hiroshi Tanji, Fuji; Michitaka Iwata, Minoo, and Hideo Sato, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 340,895, Jan. 19, 1982, Pat. No. 4,415,726. This application Aug. 29, 1983, Ser. No. 527,499
Claims priority, application Japan, Jan. 19, 1981, 56-5131; Feb. 9, 1981, 56-16902
Int. Cl.³ D01D *5/048*
U.S. Cl. 264—101 **4 Claims**

1. A process for producing polyester fiber consisting essentially of extruding a melt of polyester, passing the extruded filaments through a heating zone provided at the surface of the nozzle and having a length of at least about 5 cm and a temperature of about 150° C. to about the melting point of the polymer, applying a vacuum with an aspirator located below the heating zone, and then winding at a winding speed of at least about 7,000 m/min.

4,496,506

METHOD FOR SHAPING GREEN BODY OF CERAMIC POWDER AND CERAMIC BODY OBTAINED BY FIRING SAME

Naoyuki Sakato, Saitama, and Tetsuo Kitagaki, Kanagawa, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 412,960
Claims priority, application Japan, Sep. 1, 1981, 56-137250
Int. Cl.³ C04B *35/64*
U.S. Cl. 264—109 **6 Claims**

1. A method for shaping a green body of a ceramic powder which comprises:

admixing 100 parts by weight of a ceramic powder with an aqueous solution containing from 0.1 to 10 parts by weight of, as a binder, a modified polyvinyl alcohol substantially composed of the monomeric units expressed by the formulas

$$-CH_2-\underset{\underset{OH}{|}}{CH}-,\quad -CH_2-\underset{\underset{OCOCH_3}{|}}{CH}-\quad \text{and} \quad -CH_2-\underset{\underset{(Z)_a-R}{|}}{CH}-$$

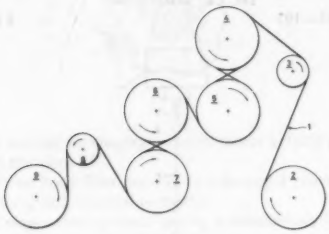
in mole fractions x, y and z, respectively, in which R is a monovalent hydrocarbon group having at least 4 carbon atoms, Z is a divalent linking unit which is either —O— or —O—CO—, a is a number of zero or 1, y is a positive number not exceeding 0.3 and z is a positive number in the range from 0.0001 to 0.1 with the proviso that $x+y+z$ is equal to 1, to give a blend wet with the aqueous solution, shaping the wet blend into a formed body, and drying the thus shaped formed body.

4,496,507

PRODUCTION OF STRING-LIKE POLYTETRAFLUOROETHYLENE

Koichi Okita, and Shigeru Asako, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 2, 1982, Ser. No. 394,958
Claims priority, application Japan, Jul. 4, 1981, 56-104758
Int. Cl.³ B29F 5/02
U.S. Cl. 264—127 **3 Claims**



1. A process for producing a string-like porous material of a polytetrafluoroethylene, comprising the steps of:

molding polytetrafluoroethylene into a string-like shape, the polytetrafluoroethylene containing a liquid lubricant, the molding being performed by a paste process:

removing the liquid lubricant;

providing a low speed set of heating rolls and a high speed set of heating rolls, wherein the heating rolls are each provided with a plurality of grooves, and the temperature of the low speed heating rolls is higher than the temperature of the high speed heating rolls;

placing the molded polytetrafluoroethylene on the low speed pair of heating rolls by threading it in a FIG. 8 configuration around the low speed rolls and within the grooves thereof;

placing the molded polytetrafluoroethylene on the high speed pair of heating rolls by threading it in a FIG. 8 configuration around the high speed rolls and within the grooves thereof;

rotating each of the high speed pair of rolls at the same speed and each of the low speed pair of rolls at the same speed, the high speed pair of rolls being rotated faster than the low speed pair of rolls to create a uniform compression force during the stretching, the force being applied in the peripheral direction of the string-like material;

sintering the stretched string-like material at a temperature of 327° C. or more.

4,496,508

METHOD FOR MANUFACTURING POLYPROPYLENE SPUN-BONDED FABRICS WITH LOW DRAPING COEFFICIENT

Ludwig Hartmann; Ivo Rüzek, and Engelbert Löcher, all of Kaiserslautern, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,701
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151322
Int. Cl.³ D01D 5/20
U.S. Cl. 264—167 **14 Claims**

1. A method for manufacturing polypropylene spun-bonded fabrics, from partially-drawn polypropylene filaments, comprising:

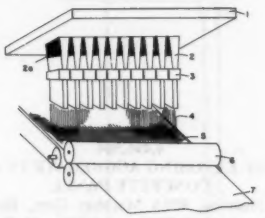
preparing a polypropylene melt at a temperature of about 240° C. to 280° C.;

forming polypropylene filaments by extruding the melt through a spinning nozzle at an extrusion velocity of about 0.02 meters/second to about 0.20 meters/second, said spinning nozzle having holes with a diameter less than about 0.8 millimeter;

allowing the filaments extruded from the lower edge of the spinning nozzles to fall vertically a distance of at most about 0.8 meter;

quenching the filaments by means of transversely blowing air over said filaments at a temperature between about 20° C. to about 40° C.;

aerodynamically drawing the extruded filaments by means suffieient to create a filament withdrawal velocity between about 20 meters/second and 60 meters/second, and such that the ratio of the extrusion velocity to the withdrawal velocity is between about 1:200 and 1:1000;



forming a fabric web by depositing the aerodynamically drawn filaments onto a moving porous support that has a vacuum beneath it creating suction; and

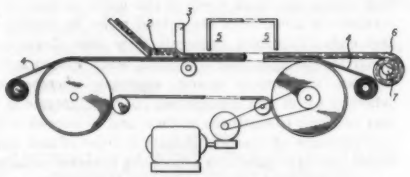
bonding the fabric web to provide the spun-bnded fabric, wherein said aerodynamically drawn filaments have a maximum tensile elongation of at least about 200%, and have a fiber shrinkage determined in boiling water of less than about 10%.

4,496,509

METHOD OF PRODUCING CERAMIC TAPES

Katsuhiko Kita; Junzo Fukuda, both of Nagoya, and Shiro Kawahito, Wakayama, all of Japan, assignors to Narumi China Corporation, Nagoya and Kao Soap Co., Ltd., Tokyo, both of, Japan

Filed Apr. 26, 1983, Ser. No. 488,722
Claims priority, application Japan, Apr. 26, 1982, 57-71086
Int. Cl.³ B32B 5/16
U.S. Cl. 264—175 **10 Claims**



1. A method of preparing green ceramic tapes, comprising:

adding to 100 parts by weight of a fine ceramic powder, 2 to 15 parts by weight, in terms of its resin content, of a binder mixture consisting of an aqueous polyurethane and a water-soluble acrylic resin, the amount of said water-soluble acrylic resin ranging from 10 to 1500 parts by weight per 100 parts by weight of said aqueous polyurethane in said binder mixture;

adding a small amount of a dispersing agent to the mixture followed by a sufficient amount of water;

kneading the resultant mixture for a time sufficient to prepare an aqueous slip;

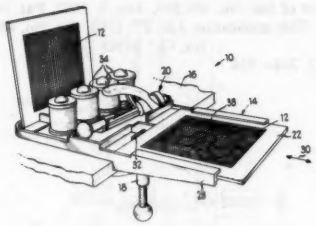
forming a tape from said aqueous slip; and then

drying the green tape obtained.

4,496,510
ACTIVITY TOY

Steven P. Hanson, Winnetka, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 10, 1983, Ser. No. 550,576
Int. Cl.³ B29C 21/00; B29D 31/00; B29F 3/00
U.S. Cl. 264—176 R 12 Claims



1. A method of creating a textured design using an extrudable substance comprising the steps of:

filling an extruder having an extrusion opening with an extrudable substance;

positioning a screen with opposed sides and mesh spaces extending between the opposed sides so that one of the sides faces the user;

positioning the extruder with the extrusion opening adjacent the opposite side of the screen;

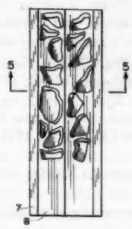
operating the extruder to cause extrusion of the plastic material through the opening and through the mesh spaces aligned with the opening; and

moving the extruder along the opposite side of the screen to force the plastic substance through a desired pattern of mesh openings thereby creating a textured design viewable from the side of the screen facing the user.

4,496,511
METHOD OF MOLDING STONE FACED PILLARS AND THE LIKE

John H. Virgili, 507 Oakwood Ave., Springdale, Pa. 15144

Filed Sep. 23, 1982, Ser. No. 422,039
Int. Cl.³ B29C 1/02
U.S. Cl. 264—225 5 Claims

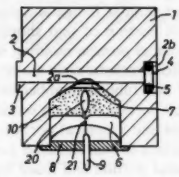


1. A method of forming a right angular mold for forming a pair of surfaces of a stone-faced rectangular pillar, comprising forming a rectangular base, attaching stone pieces to two sides of said base, providing separating strips at the corners of said base, applying molding material to said base and stone pieces, also to said strips so as to form two molding strips, each having molding flanges at the edges thereof, removing said strips, attaching two of said flanges together to form a right angular mold.

4,496,512
METHOD FOR MAKING AN ION-SENSITIVE CAPILLARY ELECTRODE

Hermann Marsoner, and Christoph Ritter, both of Graz, Austria, assignors to AVL AG, Schaffhausen, Switzerland

Division of Ser. No. 000,723, Jan. 3, 1979, abandoned. This application Dec. 8, 1982, Ser. No. 447,997
Claims priority, application Switzerland, Jan. 3, 1978, 47/788; Austria, Jun. 9, 1978, 4200/78
Int. Cl.³ B29C 13/00; B29D 31/00; B29G 7/00
U.S. Cl. 264—267 5 Claims



1. A method of manufacturing an ion-sensitive capillary electrode containing an electrode housing, the housing having an axial bore there along and a further bore intersecting said axial bore, comprising the steps of:

introducing an elastic hose into said axial bore; sealing an intersection location of the axial bore and the further bore by tightly applying the hose against the wall of the axial bore;

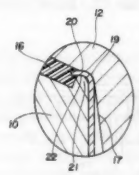
introducing a measured quantity of a polymerizable mixture in a liquid state into the further bore; said mixture being such that the polymerized mixture is releasable from said hose;

polymerizing said mixture and after polymerization thereof extending the elastic hose so that it constricts; and thereafter removing the hose from the electrode housing.

4,496,513
TUBULAR CONTAINER MOLDING METHOD AND APPARATUS

Tatsuo Ishikawa, Chiba, and Yoshiharu Hatakeyama, Tokyo, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,012
Claims priority, application Japan, May 25, 1982, 57-87265
Int. Cl.³ B29C 5/00; B29D 31/00; B29F 1/10
U.S. Cl. 264—267 2 Claims



1. A tubular container molding method comprising the steps of:

inserting a substantially cylindrical core block, including a gently sloped upper surface and an annular flange raised about the periphery of said upper surface and having a flat upper edge, into a tubular member formed of synthetic resin material as a container body to have a predetermined length and diameter, with an upper marginal portion of said tubular member being projected upwardly beyond said annular flange;

closing over said core block a cavity mold including a gently

sloped lower surface, a steeply sloped guide surface and an annular flat portion formed between said lower surface and said guide surface, thereby defining container conical and neck portion molding sections in an air gap between said core block and said cavity mold;

during said closing of said cavity mold, pressing said upper marginal portion of said tubular member against said annular flat portion of said cavity mold by said annular flange of said core block, to thereby inwardly bend said upper marginal portion to form a flange-like shoulder portion;

tightly holding said shoulder portion between said flat upper edge of said annular flange and said annular flat portion, with an end portion of said shoulder portion projecting into said conical portion molding section;

injecting molten synthetic resin material compatible with the material of said tubular member into said container conical and neck portion molding sections, thereby to mold a neck portion and a conical portion of the container with said end portion of said shoulder portion being embedded in said conical portion and fused together; and

disassembling said core block and said cavity mole after cooling said molten resin.

4,496,514

PROCESS USING SUPERCOOLED LIQUID LACTAM MIXTURES

Wei-Yeih W. Yang, Maple Heights, and Yoshihisa Okamoto, Sagamore Hills, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 27, 1983, Ser. No. 461,343
Int. Cl.³ B29F *1/00*
U.S. Cl. 264—328.6 **10 Claims**

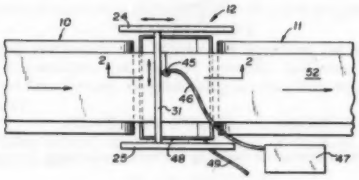
1. A process comprising the steps of preparing a polymerization mixture by mixing a lactam polymerization catalyst, a promoter, and a separate supercooled mixture of at least two lactams that remains in a liquid state at ambient temperature; introducing said mixture into a mold maintained at an elevated temperature at which polymerization of said lactams is carried out quickly; and extracting a molded object from the mold.

4,496,515

METHOD FOR CUTTING GYPSUM BOARD WITH HIGH VELOCITY FLUID CUTTING JET

Mitchell P. Ptasienski, Lake Zurich; Robert M. Mustoe, Winnetka, both of Ill., and Fred H. Zajonc, deceased, late of Richmond, Va. (by Margaret S. Zajonc, executrix), assignors to United States Gypsum Company, Chicago, Ill.

Filed Sep. 29, 1980, Ser. No. 191,888
Int. Cl.³ B32B *31/18*
U.S. Cl. 264—504 **11 Claims**



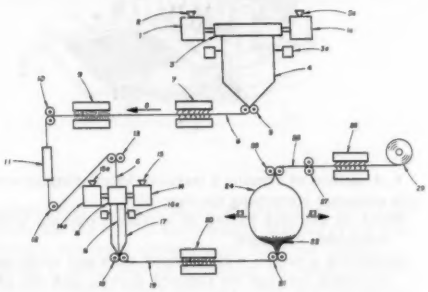
1. A method for making gypsum wallboard, which comprises preparing an aqueous slurry comprising calcined gypsum, depositing said slurry on a moving conveyor to form a continuous sheet, permitting said slurry to reach at least the initial stiffening stage, cutting said sheet transversely by means of a high pressure and high velocity fluid jet into individual boards before the calcined gypsum slurry has reached the temperature rise set stage, permitting the calcined gypsum in the cut gypsum board to set completely, and drying said board.

4,496,516

PROCESS FOR FORMING ORIENTED MULTI-LAYER FILMS HAVING A DIFFERENT ORIENTATION DISTRIBUTION BETWEEN LAYERS

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Division of Ser. No. 406,590, Aug. 9, 1982, Pat. No. 4,442,147. This application Apr. 27, 1983, Ser. No. 488,944
Int. Cl.³ B29D *7/24*
U.S. Cl. 264—514 **8 Claims**



1. A process for forming a multi-layer film having a different orientation distribution between the layers thereof comprising:

extruding a first tubular layer having a first non-stretched diameter;

longitudinally folding said first tubular layer;

extruding a second tubular layer of an orientable thermoplastic material, having a second non-stretched diameter, about said first folded tubular layer wherein said second non-stretched diameter is less than said first non-stretched diameter;

inflating said first tubular layer to no more than said first non-stretched diameter;

whereby said second tubular layer is stretched and oriented by the inflation of said first tubular layer.

4,496,517

PROCESS FOR PREPARING SATURATED POLYESTER RESIN BOTTLES

Harumi Kinoshita; Hideo Kushida; Takeshi Itakura; Masao Akutsu; Takuzo Takada, and Hiroaki Sugiura, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co. Ltd., Japan

Continuation of Ser. No. 128,351, filed as PCT 78/00036, Dec. 2, 1978, § 102(e) dated Jul. 30, 1979, abandoned. This application Apr. 22, 1982, Ser. No. 370,891
Claims priority, application Japan, Dec. 2, 1977, 52-144738; Dec. 29, 1977, 52-159073; Jan. 11, 1978, 53-1804; Jan. 12, 1978, 53-2296
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—521 **5 Claims**

1. A process for preparing a saturated polyester resin bottle from a tubular intermediate piece made of saturated polyester resin having a bottom wall and a top opening, comprising the sequential steps of:

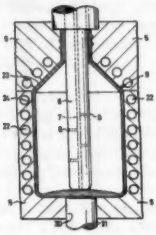
heating the intermediate piece to a temperature suitable for biaxial orientation and setting the same in a heated mold for blow molding;

blowing compressed gas into the intermediate piece while inserting a rod downwardly into the interior of the intermediate piece to conform the intermediate piece to the inner walls of the mold and effect biaxial orientation;

heat fixing the sidewalls of the bottle at a temperature higher than said temperature suitable for biaxial orientation to

which said intermediate piece has been heated while maintaining gas pressure in the bottle to effect thermal fixing of said sidewalls heated to said higher temperature after the formation of the bottle by said biaxial orientation, the duration of the last-mentioned heating step being sufficiently short that crystallization of the polyester resin and milky white discoloration thereof do not occur; and

lowering the temperature of the bottle and removing the bottle from the mold;



wherein, during biaxial orientation of the intermediate piece and while the bottle is kept along the inner walls of the mold, the center of the bottom wall of the bottle is protruded inwardly so that the thickness and degree of orientation of a lower half of the resulting tapering rising wall of the protrusion are substantially the same as those of the trunk portion of the bottle, thereby making it possible to prevent heat deformation of the bottom wall; and wherein the bottom of the bottle is also thermally fixed without crystallization and milky white discoloration.

4,496,518

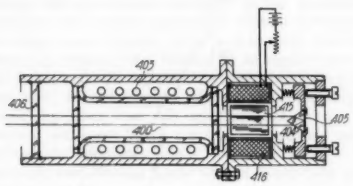
TM_O AND TE_O CAVITY RESONATOR FOR PROJECTING PLASMA CONFINING TE_O MODE COMPONENTS

Georges R. P. Marie, 17, Ave. Raymond Croland, Fontenay-aux-Roses, France (92260)

Continuation-in-part of Ser. No. 125,089, Feb. 27, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,151

Int. Cl.³ G21B *1/00;* **H01S** *3/082*

U.S. Cl. 376—104 **5 Claims**



1. An electromagnetic cavity resonator for sustaining TM_O and TE_O mode wave components, said cavity resonator being adapted for substantially increasing the TE_O mode components, decreasing the TM_O mode components and projecting plasma confining TE_O mode components on to a plasmatized material, said electromagnetic cavity resonator comprising:

a first electromagnetic wave semi-reflecting reflector forming a first outer boundary of said cavity resonator;

a second electromagnetic wave reflector forming a second outer boundary of said cavity resonator and facing the first reflector, said second reflector being an outer surface of a transparent material having an index of refraction n;

said transparent material including a conical member of revolution having an axial location integral with the second reflector on the side of the second reflector facing the first reflector, said conical member having an angular half aperture i equal to the complement of the Brewster's angle to $\pi 2$, so that $\tan(\pi/2-1)=1/n$, whereby said second reflector and member act simultaneously as a boundary of the cavity resonator and as a filter for removing TM_O mode components;

an active lasing medium located between the first and second reflectors so that TM_O mode components, at a given wavelength, propagate through the second reflector;

a TM_O—TM_m mode coverter means for rotating the polarization direction of the TM_O mode components propagating through the second reflector by an angle of $\pi/2$ to derive TE_O mode components; and

means for focusing said TE_O mode components on to a material to be plasmatized.

4,496,519

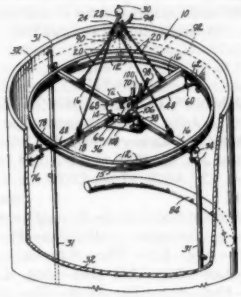
NUCLEAR REACTOR VESSEL DECONTAMINATION SYSTEMS

Paul J. McGuire, 7402 E. Wethersfield Rd., Scottsdale, Ariz. 85260

Filed Mar. 9, 1981, Ser. No. 241,597

Int. Cl.³ G21C *19/00;* **B05B** *3/00;* **B08B** *3/00*

U.S. Cl. 376—316 **7 Claims**



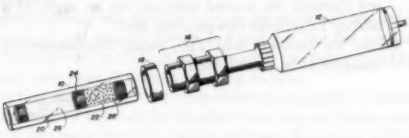
1. A decontamination system adapted to being temporarily installed by being raised above and thereafter lowered progressively into an upright open-topped cylindrical nuclear reactor vessel during a decontamination operation being performed on the interior of the vessel, comprising guide means installed within the reactor vessel, a circular horizontal track smaller than the diameter of the vessel, means on the track for engaging the guide means to center the track in the vessel, a pair of oppositely directed arms supported and guided on the track, a high pressure nozzle assembly on each arm, each assembly including a pair of nozzles spaced apart from each other in a vertical direction, at least one of the nozzles being formed to direct a generally cylindrical jet toward the wall and at least one other nozzle being formed to direct a generally fan shaped sweeping pattern toward the wall, means for imparting a rotary motion to the arms in a full circle around the track with the nozzle assemblies in close proximity to the interior wall of the vessel and means for targeting fluid under high pressure through the nozzles at the interior wall.

4,496,520

FIELD DETECTION OF 2,4,6-TRINITROTOLUENE IN WATER BY ION-EXCHANGE RESINS

Carl A. Heller; Eric D. Erickson, both of China Lake, Calif., and Sterling R. Greni, Newport, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1982, Ser. No. 380,321
Int. Cl.³ G01N *33/18, 33/22*
U.S. Cl. 422—60 **13 Claims**



1. An indicator tube for the detection of the presence of trinitrotoluene in fresh water comprising:

a transparent tube having a first compartment and a second compartment, and having an entry end and an exit end allowing a flow through passage;

glass wool separating said first and second compartments, within said transparent tube;

strong base impregnated glass beads containing said strong base in an amount effective to convert trinitrotoluene to a highly colored anion, and retained within said first compartment, said first compartment positioned adjacent to said entry end;

and

a strongly basic anion exchange resin having an affinity for said highly colored anion, and retained within said second compartment, said second compartment positioned adjacent to said exit end for enabling observation of the length of color change caused by said highly colored anion combining with said exchange resin in said second compartment, for comparison with a set standard.

4,496,521

INSULIN-POTENTIATING PEPTIDES

U. James Lewis, La Jolla, Calif., assignor to The Whittier Institute for Diabetes and Endocrinology, La Jolla, Calif.

Filed Jul. 15, 1983, Ser. No. 514,158
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 514—12 **13 Claims**

1. A composition of matter in the form of a synthetic peptide having the formula: H—Phe—Pro—Thr—Ile—Pro—Leu—Ser—Arg—Leu—Phe—Asp—Asn—Ala—Met—Leu—Arg—Ala—His—Arg—Leu—His—Gln—Leu—Ala—Phe—Asp—Thr—Tyr—Gln—Glu—Phe—Glu—Glu—Ala—Tyr—Ile—Pro—Lys—Glu—Gln—Lys—Tyr—Ser—OH wherein one or more residues can be deleted beginning at the N-terminus and extending through Arg in the 16-position, or a nontoxic salt thereof.

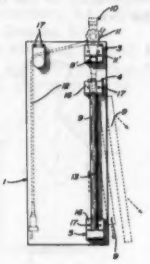
4,496,522

VERTICAL DECONTAMINATION BATH FOR FIBRESCOPES

Louise McConnell, 10 Terrasse Goyer, Deux Montagnes, Quebec, Canada H7R 4W1

Filed Apr. 1, 1983, Ser. No. 482,314
Int. Cl.³ A61L *2/18, 2/26*; B08B *9/00*; A47K *3/11*
U.S. Cl. 422—300 **6 Claims**

1. A decontamination bath and support assembly for fibrescopes of the type having a light source tube, a control section and an insertion tube, wherein the bath and support assembly comprises a light source tube support bracket having a round top portion of greater radius of curvature than that to which a light source tube can be bent without damage; a control section support bracket; a straight, rigid, and hollow bath tube adapted to contain a sterilization solution wherein said bath tube has an open top end and a sealed bottom end; an upper bath tube support bracket; a lower bath tube support bracket; and means for supporting said control section bracket, said upper bath tube bracket and said lower bath tube bracket in vertically spaced-apart and vertically-aligned relation for removably supporting said bath tube between said upper and lower bath



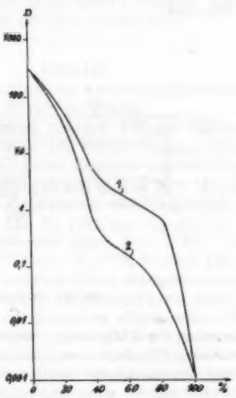
tube brackets, said light source tube bracket being supported on said support means in horizontally-spaced relation from said control section support bracket whereby a fibrescope may be supported thereon with a light source tube thereof supported on said light source tube bracket, the fibrescope control section supported on top of said control section bracket, and the fibrescope insertion tube inserted within said bath tube.

4,496,523

PROCESS FOR SEPARATING THE ACTINIDES AND LANTHANIDES PRESENT IN THE TRIVALENT STATE IN AN ACID AQUEOUS SOLUTION

Michelle Bonnin; Claude Musikas, both of Bures Sur Yvette, and Pierre Vitorge, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 2, 1982, Ser. No. 394,491
Claims priority, application France, Jul. 9, 1981, 81 13530
Int. Cl.³ C01G *56/00, 43/00*; C01F *17/00*
U.S. Cl. 423—9 **8 Claims**



1. A process for the separation of the actinides and lanthanides present in the trivalent state in an acid aqueous solution, wherein the actinides present in such aqueous solution are extracted selectively in an organic solvent by bringing the solution into contact with an organic solvent comprising a first extracting agent formed by an organic bonding agent having an electron-donor nitrogen atom and a second extracting agent formed by an acid organosoluble organic compound able to

exchange its H^+ ions for metal ions or by metallic salt of such compound.

2. A process according to claim 1, wherein the first extracting agent is a heterocyclic organic bonding agent with an electron-donor nitrogen atom.

7. A process according to claim 2, wherein the heterocyclic organic bonding agent is selected from the group consisting of 2,4,6-tri(2-pyridyl)-1,3,5 triazine, 1,10 orthophenanthroline and 4,7 diamyl orthophenanthroline.

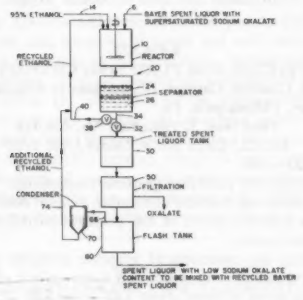
8. A process according to claim 1, wherein the acid organic compound is selected from the group consisting of di-nonyl naphthalene sulphonic acid, α-bromo caproic acid, caproic acid, and the alkaline salts of such acids.

4,496,524

PROCESS FOR THE REMOVAL OF SODIUM OXALATE COMPOUNDS FROM BAYER SPENT LIQUOR

J. Finley Bush, New Kensington, and Paul J. The, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 8, 1984, Ser. No. 587,589
Int. Cl.³ C01F *7/00, 7/06*
U.S. Cl. 423—122 **12 Claims**



1. A process for the purification of Bayer spent liquor from a Bayer-type caustic digestion process to remove organic impurities therein which comprises:

(a) treating said spent liquor with up to 50 vol. % ethanol to precipitate said organic impurities without precipitating substantially any alumina values and to form two layers comprising, respectively, ethanol in an upper layer, and spent liquor and said organic precipitate in a lower layer;

(b) separating the lower spent liquor layer containing said organic impurities from said upper ethanol layer;

(c) filtering said spent liquor layer to remove said precipitated organic impurities; and

(d) returning said filtered liquor to said Bayer-type caustic digestion process.

4,496,525

METHOD FOR USING CHEMICAL ADDITIVES TO PROTECT UTILITY BOILER AIR HEATERS WHILE INCREASING UNIT GENERATION CAPACITY

Vincent M. Albanese, Lisle, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 25, 1983, Ser. No. 517,111
Int. Cl.³ C01B *17/00*
U.S. Cl. 423—242 **3 Claims**

1. A method of improving the efficiency of large industrial boilers of the type using heat exchangers heated by superheated steam diverted from the steam used to produce energy, which heat exchangers elevate the temperature of the air heater section of such boilers to minimize corrosion caused by the condensation of SO_3 to produce sulfuric acid which comprises ratioing an effective amount of a sulfuric acid neutralizing chemical into the air heater section of such boilers to neutralize increases in sulfuric acid formed due to the reduction of air temperatures caused by throttling the steam fed to said heat exchangers.

4,496,526

PROCESS FOR THE PRODUCTION OF POTASSIUM MAGNESIUM PHOSPHATE

Karl-Richard Löblich, Barsinghausen, Fed. Rep. of Germany, assignor to Kali und Salz AG, Kassel, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,731
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204238
Int. Cl.³ C01B *25/26*
U.S. Cl. 423—306 **5 Claims**

1. Process for the production of potassium magnesium phosphate through reaction of acid, phosphate ion-containing aqueous solutions with a potassium salt and basic reacting magnesium compounds and separation of crystallized potassium magnesium phosphate from a mother liquor, comprising the sequential steps of dispersing the potassium salt in excess stoichiometric amount and the stoichiometrically necessary amount of basic magnesium compound into a mixture of circulating mother liquor and fresh water to form a dispersion of 200 g/1 or less solids content, quickly stirring the acid phosphate solution into the dispersion, adding potassium magnesium phosphate seed crystals to the dispersion, adjusting the pH-value of the reaction mixture to alkaline with a basic reacting alkali or earth alkali compound, and separating crystallized potassium magnesium phosphate hexahydrate as crude salt from the mother liquor.

4,496,527

DICALCIUM PHOSPHATE DIHYDRATE HAVING IMPROVED MONOFLUOROPHOSPHATE COMPATIBILITY AND PROCESS FOR THE PREPARATION THEREOF

Fawzy G. Sherif, Stony Point; Helmut W. Majewski, Nyack, and Francis A. Via, Yorktown Heights, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 336,214, Dec. 31, 1981, abandoned.
This application Jul. 8, 1983, Ser. No. 511,973
The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.
Int. Cl.³ C01B *25/32*
U.S. Cl. 423—309 **4 Claims**

1. A process for preparing dicalcium phosphate dihydrate having improved monofluorophosphate compatibility comprising the steps of:

(a) reacting a slaked lime slurry with phosphoric acid to form a monocalcium phosphate solution;

(b) adding to said solution additional slaked lime slurry and pyrophosphoric acid in amounts sufficient to form a dicalcium phosphate dihydrate slurry having a pH ranging from above about 2.2 to below 4.7; and

(c) separating said dicalcium phosphate dihydrate from said slurry.

4,496,528

PROCESS FOR THE PREPARATION OF ZEOLITE ZK 5

Michel Bourgogne, Reidisheim; Jean-Louis Guth, Brunstatt; Georges Szabo, Montivilliers, and Raymond Wey, Mulhouse, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Mar. 29, 1983, Ser. No. 480,037
Claims priority, application France, Apr. 1, 1982, 82 05665
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—328 **38 Claims**

1. A process for the preparation of zeolite ZK 5 from a starting zeolite selected from the group consisting of zeolites P (Cl), P′ (Cl), Q (Br) and Q′ (Br), comprising extracting barium ions contained in the starting zeolite by means of a barium-

binding agent selected from the group consisting of precipitating agents which form with the barium ions a compound that precipitates, and of complexing agents which form with the barium ions a barium complex.

4,496,529

PREPARATION OF METAL CYANATES FROM ALKYL CARBAMATES

Theodore C. Kraus, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Jun. 20, 1984, Ser. No. 622,365
Int. Cl.³ C01C *3/14*
U.S. Cl. 423—365 **5 Claims**

1. A process for preparing metal cyanates comprising reacting an alkyl carbamate having the formula

$$NH_2-\overset{\overset{O}{\|}}{C}-OR$$

wherein R is a lower alkyl group having 1 to 4 carbon atoms with an alkali metal hydride or an alkaline earth metal hydride.

4,496,530

PROCESS FOR THE PRODUCTION OF HYDROGEN AND CARBONYL SULFIDE FROM HYDROGEN SULFIDE AND CARBON MONOXIDE USING A METAL INTERCALATE OF GRAPHITE AS A CATALYST

Michael F. McGuiggan, Shaker Heights, and Philip L. Kuch, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,581
Int. Cl.³ C01B *31/26, 3/04*
U.S. Cl. 423—416 **20 Claims**

1. A process for the production of hydrogen and carbonyl sulfide, the process comprising contacting gaseous hydrogen sulfide with gaseous carbon monoxide in the presence of a catalytic amount of an intercalate of the formula:

$$M_aC_{100-a} \quad (I)$$

where

M is at least one of Co, Fe, Ni, Pd, Cu, Mo, W, V, Nb, Ta, Ru, Os, Rh, Ir and Ti;

C is graphite; and

a represents the weight percent of M present in the intercalate and has a value between about 0.1 and 30.

4,496,531

PROCESS FOR THE PRODUCTION OF HYDROGEN AND CARBONYL SULFIDE FROM HYDROGEN SULFIDE AND CARBON MONOXIDE USING A PRECIOUS METAL PROMOTED METAL OXIDE/SULFIDE CATALYST

Philip L. Kuch, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,883
Int. Cl.³ C01B *31/06, 3/04*
U.S. Cl. 423—416 **21 Claims**

1. A process for the production of hydrogen and carbonyl sulfide, the process comprising contacting gaseous hydrogen sulfide with gaseous carbon monoxide in the presence of a catalytic amount of a composition of the formula:

$$M_{0.1-2}M'_{0.01-1}M''_{0.01-1}O_xS_y \quad (I)$$

where

M is at least one of Mo, W and Fe;

M′ is at least one of Ru, Rh, Ag, Pt, Pd, Au, Re, Os and Ir;

M″ is at least one of V, Cr, Ti, Co, Ni and Cu; and the sum of x+y is a number that satisfies the valence requirements of the other elements present.

4,496,532

RUTHENIUM CARBONYLATES AND PROCESSES FOR THEIR PREPARATION

Sheldon G. Shore, and Alakananda Bhattacharyya, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed Jul. 27, 1983, Ser. No. 517,723
Int. Cl.³ C01G *1/04, 55/00;* C07F *15/00*
U.S. Cl. 423—417 **38 Claims**

1. The ruthenium carbonylate anion of the formula $[Ru_4(CO)_{11}]^{6-}$, the alkali metal, amine, quaternary ammonium and phosphonium salts of said anion and the completely protonated form of said anion, namely $H_6[Ru_4(CO)_{11}]$.

4. A process for preparing the ruthenium carbonylate anion of the formula $[Ru_4(CO)_{11}]^{6-}$ which comprises treating $Ru_3(CO)_{12}$ with a mixture of an alkali metal, a carrier compound which will carry an electron produced by the ionization of said alkali metal to said $Ru_3(CO)_{12}$, and a solvent which will solubilize at least the electron-bearing form of said carrier compound, each mole of said $Ru_3(CO)_{12}$ being treated with at least about 4.5 moles of said alkali metal, said process being carried out in an environment free from molecular oxygen and water.

4,496,533

PROCESS FOR PURIFYING GRAPHITE

Richard A. Clausius, Chicago, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Nov. 3, 1982, Ser. No. 438,814
Int. Cl.³ C01B *31/04;* B03D *3/38, 1/00*
U.S. Cl. 423—448 **9 Claims**

1. A process for purifying graphite comprising:

(1) comminuting graphite containing mineral matter to liberate at least a portion of the graphite particles from the mineral matter;

(2) mixing the comminuted graphite particles containing mineral matter with water and hydrocarbon oil having a boiling point of from about 130° F. to 250° F. to form a fluid slurry;

(3) separating a water phase containing mineral matter and a hydrocarbon oil phase containing graphite particles; and

(4) separating the graphite particles from the hydrocarbon oil to obtain graphite particles reduced in mineral matter.

4,496,534

METHOD FOR RECONDITIONING BACTERIA-CONTAMINATED HYDROGEN SULFIDE REMOVING SYSTEMS

Dennis D. Delaney, Placentia, and Donald M. Fenton, Anaheim, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

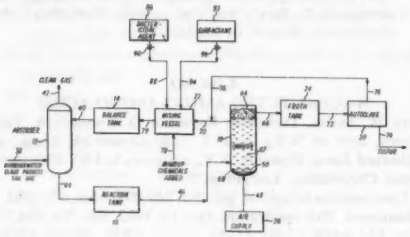
Continuation-in-part of Ser. No. 331,070, Dec. 16, 1981, Pat. No. 4,393,037, and a continuation-in-part of Ser. No. 441,669, Nov. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 331,070, Dec. 16, 1981,. This application Dec. 6, 1982, Ser. No. 447,227
The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.
Int. Cl.³ B01D *53/34;* C01B *17/04, 17/14*
U.S. Cl. 423—573 R **19 Claims**

1. A method for reconditioning a hydrogen sulfide gas removal system employing an aqueous washing solution in which hydrogen sulfide is reacted to form elemental sulfur and which has means for agglomerating said particles to enable sulfur removal from said solution for reuse, after said system and said solution have become contaminated with living, sulfur-feeding bacteria to an extent that normal operations of said sulfur removal means and of said solution regenerating means are substantially impaired, said reconditioning method comprising the steps of:

(a) contacting said sulfur-feeding bacteria in said solution with a bactericidal agent to destroy substantially all of said sulfur-feeding bacteria; and

(b) contacting said sulfur particles in said solution with a surfactant to remove a sufficient number of destroyed sulfur-feeding bacteria from surfaces of said sulfur particles to enable said particles to agglomerate in said sulfur removal means;

wherein said bactericidal agent is sufficiently water soluble to allow the dissolving of a bacterially lethal concentration of said bactericidal agent into said washing solution, wherein said



surfactant is nonionic and, at least, partially water soluble, and wherein both said bactericidal agent and said surfactant are substantially (1) stable at the conditions existant within said washing solution, (2) innocuous to the oxidation of hydrogen sulfide to sulfur, (3) innocuous to the regeneration of said washing solution with oxygen, (4) innocuous to the recovery of product sulfur and (5) chemically nonreactive or decomposable within the washing solution except in cases where essentially all products of reaction and/or decomposition are substantially innocuous to the environment and substantially innocuous to the hydrogen sulfide removal system.

4,496,535

POLYURETHANE POLYENE COMPOSITIONS

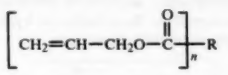
Francis E. Gould, Princeton, and Christian W. Johnston, Neshanic Station, both of N.J., assignors to Tyndale Plains-Hunter, Ltd., Princeton, N.J.

Division of Ser. No. 433,481, Oct. 8, 1982, Pat. No. 4,454,309, which is a continuation-in-part of Ser. No. 206,407, Nov. 12, 1980, Pat. No. 4,359,558. This application May 7, 1984, Ser. No. 607,676

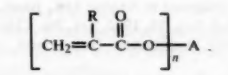
Int. Cl.³ B32B *1/08;* **A61J** *3/06, 3/00*

U.S. Cl. 424—19 **23 Claims**

1. As an article of manufacture, a shaped, three-dimensional structure formed of a hydrophilic polyurethane polyene composition comprising from about 10 to about 50 parts by weight of a polyene selected from the group consisting of polyallyl esters having the formula:



wherein n is a whole number larger than 1 and smaller than 4, and R is the residue of a polybasic acid; and polyacrylic esters having the formula:



wherein n is a whole number larger than 2 and smaller than 7, R is hydrogen or a methyl radical and A is the residue of a polyhydric alcohol; and about 100 parts by weight of a hydrophilic polyurethane resin.

4,496,536

SEBOSUPPRESSIVE COSMETIC PREPARATIONS CONTAINING LONG-CHAINED ALKANOLS AND ANTIOXIDANTS

Hinrich Möller; Siegfried Wallat, both of Monheim; Horst Höffkes, Düsseldorf, and Karl Giede, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,474

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201511

Int. Cl.³ A61K *7/06, 7/08, 31/05, 31/355*

U.S. Cl. 424—70 **4 Claims**

1. A process for treating oily hair or seborrhea which comprises administering to an individual in need of such treatment a sebosuppressively effective amount of at least one branched, long-chain alkanol having from 12 to 26 carbon atoms and at least one antioxidant selected from the group consisting of 2,6-di-tert.-butyl-4-methoxyphenol, tocopherols, and alkyl esters of gallic acid, the weight ratio of long-chain alkanol to antioxidant being from about 4:1 to 1:4.

4,496,537

BIOLOGICALLY STABLE ALPHA-INTERFERON FORMULATIONS

Henry K. Kwan, Summit, N.J., assignor to Schering Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 466,707, Feb. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 334,052, Dec. 23, 1981, abandoned. This application Sep. 16, 1983, Ser. No. 532,886

Claims priority, application South Africa, Nov. 19, 1982, 82/8580; European Pat. Off., Dec. 15, 1982, 82111665.4

Int. Cl.³ A61K *45/02;* **C12P** *21/00*

U.S. Cl. 424—85 **7 Claims**

1. In a method for preparing a formulation of high specific activity alpha-type interferon having improved biological stability by lyophilizing a solution containing said alpha-type interferon to yield a reconstitutable lyophylizate, the improvement for further increasing said biological stability to a level such that the lyophilizate substantially retains its biological activity even when stored at 20° C. for at least six months which comprises: adding to said solution prior to lyophilization (a) a compatible buffer which will maintain the pH of the reconstituted solution within the range of about 6.5 to 8.0, and (b) glycine or alanine in an amount of 5 to 150 milligrams per milliliter of water to be added for reconstitution.

4,496,538

HAEMOPHILUS INFLUENZAE B POLYSACCHARIDE-DIPHTHERIA TOXOID CONJUGATE VACCINE

Lance K. Gordon, Mount Pocono, Pa., assignor to Connaught Laboratories, Inc., Swiftwater, Pa.

Filed Jan. 6, 1982, Ser. No. 395,743

Int. Cl.³ A61K *39/102;* **C07G** *7/00*

U.S. Cl. 424—92 **3 Claims**

1. A water-soluble covalent polysaccharide-diphtheria toxoid conjugate

capable of producing T-cell dependent antibody response to polysaccharide from *Haemophilus influenzae b,*

of molecular size above 140,000 and below 4,500,000 dalton, and

of a ribose/protein ratio between 0.25 and 0.75,

prepared by mixing adipic hydrazide derivatized diphtheria toxoid in a substantially cyanogen halide-free solution with a cyanogen halide activated capsular *Haemophilus influenzae* b polysaccharide consisting of approximately equal parts of ribose, ribitol and phosphate, which had previously been sized

by heating until more than 60% of the polysaccharide was adjusted to a molecular size between 200,000 and 2,000,000 dalton.

4,496,539

METHOD FOR TREATING CANCER USING GALACTOSE-SPECIFIC LECTINS

George M. Plotkin, Lynn, Mass.; Charles J. Bendrick, Liverpool, N.Y., and George Wolf, Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 1, 1982, Ser. No. 344,497

Int. Cl.[3] **A61K** *37/48, 35/78*

U.S. Cl. 424—94 **8 Claims**

1. A method of treating cancer cells, comprising contacting the cells with a lectin which specifically binds galactose moieties on the surface of the cell membrane thereby weakening the cell membrane; and, thereafter, applying sufficient localized stress within the cell environs to rupture the weakened cell membrane.

4. A method of treating cancer cells comprising

contacting the cells with a lectin which specifically binds galactose moieties on the surface of the cell membrane, said lectin being bonded to an enzyme which catalyzes an exothermic reaction; and, then, contacting the cells with a substrate for said enzyme whereby the release of heat caused by the ensuing exothermic reaction provides stress sufficient to rupture the cell membrane.

7. A method of treating bladder cancer comprising

introducing into the bladder a lectin which binds specifically to galactose moieties on the surface of a cell membrane, said lectin being bound to an enzyme which catalyzes an exothermic reaction, and them, introducing into the bladder a substrate for said enzyme.

4,496,540

THERAPEUTIC COMPOUNDS

Sun K. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

Filed Dec. 30, 1982, Ser. No. 454,731

Int. Cl.[3] **C07C** *103/52;* **A61K** *37/02*

U.S. Cl. 514—19 **20 Claims**

1. A compound capable of inhibiting an endopeptidase responsible for a degradation pathway of enkephalin and having the general formula A—B—NHOH

wherein A is one of the aromatic group-containing amino acid residues L-tryptophyl, D-tryptophyl, L-tyrosyl, D-tyrosyl, L-phenylalanyl, or D-phenylalanyl, and B is one of the amino acids glycine, L-alanine, D-alanine, L-leucine, D-leucine, L-isoleucine, or D-isoleucine;

or a pharmaceutically acceptable salt thereof.

4,496,541

COMPOUNDS FOR TREATING HYPERTENSION

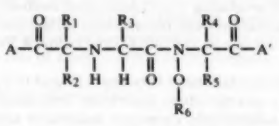
Fu-chih Huang, Boonton, N.J.; Howard Jones, Ossining; Clara Lin, and Bernard Loev, both of Scarsdale, all of N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Jan. 12, 1983, Ser. No. 457,611

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/50*

U.S. Cl. 514—2 **16 Claims**

1. Compounds of the formula



and their pharmaceutically-acceptable salts,

wherein

A and A′ are independently hydroxy, C_1–C_9 alkoxy, aryloxy, or hydroxyamino;

R_2, R_4 and R_5 are independently hydrogen, or C_1–C_9 alkyl;

R_3 is hydrogen, C_1–C_9 alkyl or ω-amino C_1–C_9 alkyl;

R_1 is phenyl C_1–C_9 alkyl, C_1–C_9 alkyl, C_3–C_9 cycloalkyl, fused cyclo C_3–C_9 alkylphenyl, or phenoxy C_1–C_9 alkyl; and

R_6 is $(CH_2)_nX$ wherein n is 0–2 and

X is hydrogen, C_1–C_9 alkyl, C_1–C_9 alkoxy, C_3–C_9 cycloalkyl, adamantyl, norbornyl, phenyl, tolyl, benzyl, phen C_1–C_9 alkyl, indolyl, dimethoxyphenyl, hydroxybenzyl, indanyl, naphthyl, tetrahydronaphthyl, decanhydronaphthyl, pyridyl, quinolyl, guanidino, pyrrolidyl, pyrrolyl, morpholinyl, furyl, furfuryl, tetrahydrofurfuryl, benzimidazolyl, thienyl, or imidazolyl.

4,496,542

N-SUBSTITUTED-AMIDO-AMINO ACIDS

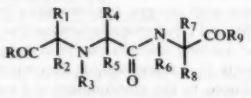
Jerry W. Skiles, Tuckahoe; Raymond D. Youssefyeh, Tarrytown, both of N.Y.; John T. Suh, Greenwich, Conn., and Howard Jones, Ossining, N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 249,053, Mar. 30, 1981, abandoned. This application Apr. 13, 1983, Ser. No. 484,729

Int. Cl.[3] **A61K** *37/00, 31/40, 31/425;* **C07C** *103/52;* **C07D** *403/00, 233/66, 233/28, 233/00, 235/04, 405/00, 211/72, 211/56, 211/30, 215/00, 221/02, 415/00, 413/00, 265/30, 279/10*

U.S. Cl. 514—2 **23 Claims**

1. Compounds of the formula



wherein R and R_9 are independently hydroxy or lower alkoxy,

R_1 and R_2 are independently hydrogen, lower alkyl, or aryl-lower alkyl having from 7 to 12 carbon atoms,

R_3, R_4, R_5, R_7 and R_8 are hydrogen or lower alkyl,

R_6 is a heterocyclic group selected from the group consisting of pyrrolyl, pyrrolinyl, pyrrolidinyl, pyridinyl, dihydropyridinyl, piperidinyl, morpholinyl, thiomorpholinyl, imidazolyl, imidazolinyl, imidazolidinyl, furanyl, furfuryl, thienyl, benzimidazolyl, thiazolyl, thiazolinyl, thiazolidinyl, indolyl, quinolinyl, isoquinolinyl, tetrahydroquinolinyl,tetrahydroisoquinolinyl, and indolylethyl,

and wherein

alkyl where present can carry at least one substituent selected from the group consisting of hydroxy, lower alkoxy, thio, lower alkylmercapto, amino, lower alkylamino, di(lower alkyl) amino, halogen, and nitro;

the heterocyclic group can carry at least one substituent selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, halogen and trifluoromethyl; and

their pharmaceutically acceptable, nontoxic acid addition salts and where R or R_9 or both are hydroxy, their pharmaceutically acceptable basic salts.

4,496,543

POLYPEPTIDES, PROCESSES FOR THEIR PRODUCTION, PHARMACEUTICAL COMPOSITIONS COMPRISING SAID POLYPEPTIDES AND THEIR USE

Wilfried Bauer, Lampenberg, and Janos Pless, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

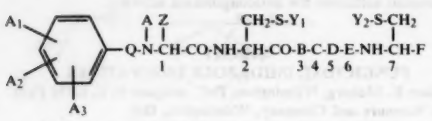
Filed Aug. 18, 1983, Ser. No. 524,374

Claims priority, application Switzerland, Aug. 24, 1982, 5031/82

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 514—11 **17 Claims**

1. A polypeptide of formula I



(I)

wherein

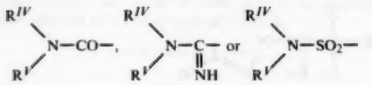
A is hydrogen, C_{1-3}alkyl or an acyl group of the formula

(a) $R^{I}CO$— wherein R^{I} is C_{1-20}alkyl, C_{3-20}alkenyl, C_{3-20}alkinyl, phenyl, naphthyl or C_{7-10}(phenylalkyl);

(b) $R^{II}SO_2$— wherein R^{II} is C_{1-10}alkyl, phenyl or C_{7-10}(phenylalkyl);

(c) $R^{III}O$—CO— wherein R^{III} is C_{1-10}alkyl or C_{7-10}(phenylalkyl); and

(d)



wherein

R^{IV} is hydrogen, C_{1-10}alkyl, phenyl or C_{7-10}(phenylalkyl) and

R^{V} is hydrogen or C_{1-10}alkyl;

A_1 is hydrogen, C_{1-3}alkyl, C_{1-3}alkoxy, halogen, OH, NO_2, esterified or amidated carboxy group of the formula

R_8O—CO— or R_8—NH—CO—

wherein

R_8 is C_{1-16}alkyl or an amide group of the formula R_9—CO—NH—

wherein

R_9 is C_{1-15}alkyl;

A_2 is hydrogen, C_{1-3}alkyl, C_{1-3}alkoxy, halogen, OH or NO_2,

A_3 is hydrogen, C_{1-3}alkyl or C_{1-3}alkoxy,

Q is C_{1-4}alkylene,

>N—CH(Z)—CO— is an (L)- or (D) phenylalanine residue optionally ring substituted by one or more members selected from the group consisting of halogen, NO_2, NH_2, OH, C_{1-3}alkyl and C_{1-3}alkoxy,

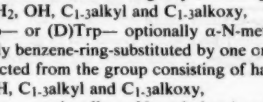
B is —Phe— optionally ring-substituted by one or more memebers selected from the group consisting of halogen, NO_2, NH_2, OH, C_{1-3}alkyl and C_{1-3}alkoxy,

C is —Trp— or (D)Trp— optionally α-N-methylated and optionally benzene-ring-substituted by one or more members selected from the group consisting of halogen, NO_2, NH_2, OH, C_{1-3}alkyl and C_{1-3}alkoxy,

D is —Lys— optionally α-N-methylated and optionally ε-N-C_{1-3}alkylated,

E is —Thr—

F is a group of formula —$COOR_1$, —CH_2OR_2,



wherein

R_1 is hydrogen or C_{1-3}alkyl,

R_2 is hydrogen or the residue of a physiologically acceptable, physiologically hydrolysable ester,

R_3 is hydrogen or methyl,

R_4 is —$CH(R_5)$—X,

R_5 is hydrogen, —$(CH_2)_2$—OH, —$(CH_2)_3$—OH, —CH_2OH, —CH(OH)—CH_3 or isobutyl,

X is a group of formula —$COOR_1$, —CH_2OR_2 or —$CON(R_6)R_7$

wherein

R_1 and R_2 have the meanings given above,

R_6 is hydrogen or C_{1-3}alkyl and

R_7 is hydrogen, C_{1-3}alkyl, phenyl or C_{7-10}phenylalkyl,

the group —$CH(R_5)$—X having the (D)- or (L)-configuration, and Y_1 and Y_2 are each hydrogen or together represent a direct bond,

whereby the residues in the 2- and 7-position each independently have the (L)- or (D)-configuration;

said polypeptide being in free or pharmaceutically acceptable protected form;

or a pharmaceutically acceptable salt or complex thereof.

4,496,544

ATRIAL PEPTIDES

Philip Needleman, Olivette, Mo., assignor to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 551,372, Nov. 10, 1983,. This application Jan. 10, 1984, Ser. No. 569,684

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 514—13 **17 Claims**

1. A peptide having potent natriuretic activity comprising the following amino acid sequence:

R_1-cys-phe-gly-gly-arg-ile-asp-arg-ile-gly-ala-gln-ser-gly-leu-gly-cys-asn-R_2

wherein

R_1=H, ser, ser-ser, and

R_2=OH, ser, ser-phe-arg, ser-phe-arg-tyr,

or the physiologically acceptable salts, esters or amides thereof.

4,496,545

NONAPEPTIDE FOR TREATING ADDICTIVE DRUG WITHDRAWAL CONDITIONS

Richard R. Scherschlicht, Inzlingen, Fed. Rep. of Germany, and René Tissot, Chene-Bourg, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 379,162, May 17, 1982, Published Application No. 4,444,758. This application Feb. 24, 1984, Ser. No. 583,520

Claims priority, application Switzerland, May 21, 1981, 3306/81

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 514—16 **6 Claims**

1. A pharmaceutical composition comprising a nonapeptide of the formula

Trp-Ala-Gly-Gly-Asp-Ala-Ser-Gly-Glu

or a pharmaceutically acceptable salt thereof in an amount between 0.55 mg and 1.1 mg and a pharmaceutically acceptable carrier for treating addictive drug withdrawal conditions in a subject.

4,496,546

ERYTHROMYCIN D AND ESTERS THEREOF

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Paul C. Watts, Mystic, all of Conn.; Riichiro Shibakawa, Handa, Japan, and Junsuke Tone, Chita, Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,820

Int. Cl.[3] **A61K** *31/71;* **C07H** *17/08*

U.S. Cl. 514—29 **12 Claims**

1. An ester of erythromycin D which is:

3″,4″-di-O-acetylerythromycin D;

3″-O-acetyl-4″-O-propionylerythromycin D, or

4″-O-acetylerythromycin D;

or a pharmaceutically-acceptable acid addition salt thereof.

9. A method for treating a bacterial infection in a mammal which comprises administering to said mammal an antibacterially effective amount of a compound of claim 1.

4,496,547

SACCHARIDE FATTY ACID ESTER FOR BLOAT-PREVENTION OR BLOAT-TREATMENT

Ryoji Kawashima, Kyoto; Akira Usagawa, Ishikawa, and Takayoshi Masuda, Aichi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 451,396

Claims priority, application Japan, Dec. 25, 1981, 56-209198

Int. Cl.³ A61K *31/70, 31/72;* **C07H** *13/06*

U.S. Cl. 514—25 **13 Claims**

7. A method for preventing or treating bloat in ruminants mammals, comprising feeding to said ruminant mammals an amount sufficient for bloat-prevention or bloat-treatment of a mixture of 3–97% saccharide fatty acid ester and 97–3% fatty acid salt.

4,496,548

COMPOSITION AND METHOD FOR REDUCING HANGOVER

Mervin J. Moldowan, and Carol Moldowan, both of 480 Benton View Dr., Philomath, Oreg. 97370

Filed Feb. 4, 1983, Ser. No. 463,736

Int. Cl.³ A61K *31/70;* **C07H** *17/04*

U.S. Cl. 514—27 **7 Claims**

3. A method for reducing effects associated with the consumption of ethyl alcohol by humans, which comprises ingestion prior to, during, or immediately following consumption of ethyl alcohol, an effective amount of a composition comprising:

(a) 12% to 80% by weight ascorbic acid;

(b) 5% to 70% by weight thiamine;

(c) 10% to 90% by weight of a compound selected from cysteine and cysteic acid; and

(d) 1.5% to 85% by weight of a flavonoid or flavonoid complex selected from the group consisting essentially of rutin, hesperidin, and hesperidin-methyl-chalcone.

4,496,549

TREATMENT OF MALARIA WITH ANTIBIOTICS

Arnold L. Oronsky, Chappaqua, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 17, 1983, Ser. No. 458,242

Int. Cl.³ A61K *31/70, 31/71, 31/35*

U.S. Cl. 514—27 **2 Claims**

1. A method of treating malaria in warm-blooded animals comprising administering to a warm-blooded animal in need of said treatment an anti-malarial effective amount of a compound selected from the group consisting of X-14868A, LL-C23024 beta and LL-C23024 iota.

4,496,550

OLIGOSACCHARIDES HAVING SELECTIVE ANTICOAGULATION ACTIVITY

Ulf P. F. Lindahl, Uppsala; Gudrun E. Bäckström, Alunda, and John Y. L. Thunberg, Uppsala, all of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden

Filed Sep. 11, 1981, Ser. No. 301,257

Claims priority, application Sweden, Sep. 15, 1980, 8006459

Int. Cl.³ A61K *31/725;* **C08B** *37/10*

U.S. Cl. 514—54 **19 Claims**

1. Oligosaccharide comprising 4–8 monosaccharide units, characterized in that it contains at least one glucosamine unit which is 3-O-sulfated, and at least one further glucosamine unit, whereby these units are connected by an iduronic unit linking monosaccharide unit, which is bound to the reducing end of the 3-O-sulfated glucosamine unit.

9. A pharmaceutical preparation, characterized in that it contains one or more oligosaccharides according to claim 1 in an amount sufficient for anticoagulation activity.

4,496,551

FUNGICIDAL IMIDAZOLE DERIVATIVES

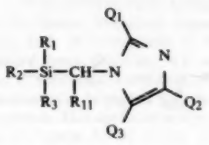
William K. Moberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 474,872, Mar. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 377,121, May 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 349,262, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 276,987, Jun. 24, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 506,895

Int. Cl.³ A61K *31/695;* **C07F** *7/18*

U.S. Cl. 514—63 **18 Claims**

1. A compound of the formula:

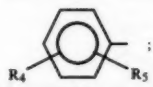


I

wherein

Q_1, Q_2 and Q_3 are independently H or CH_3;

R_1 is naphthyl, or



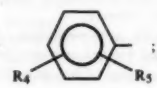
;

where

R_4 and R_5 are independently —H, halogen, $—OCH_3$, $—OCF_3$, $—SCH_3$, $—SO_2CH_3$, $—CF_3$, phenyl, phenyl substituted with halogen and/or C_1–C_4 alkyl and/or $—CF_3$, phenoxy or phenoxy substituted with halogen and/or C_1–C_4 alkyl and/or $—CF_3$;

with the proviso that both R_4 and R_5 may not simultaneously be H; and

R_2 and R_3 are independently C_1–C_6 alkyl, C_3–C_6 cycloalkyl, OR_6, or

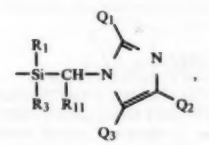


;

wherein

R_4 and R_5 are as defined above except that R_4 and R_5 may simultaneously be H; and

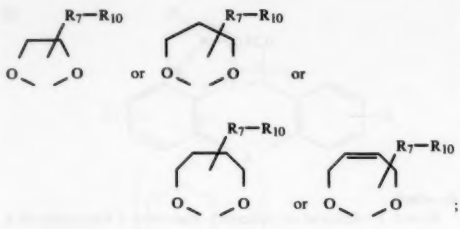
where R_6 is H, C_1–C_4 alkyl, or



,

with the proviso that when R_2 and R_3 are both OR_6, then R_6 must be C_1–C_4 alkyl; or

R_2 and R_3 together may be a 1,2- or 1,3- or 1,4-glycol bridge or a 1,4 unsaturated glycol bridge substituted by up to four alkyl groups R_7–R_{10} that have a total of up to four carbon atoms



R_{11} is H or C_1–C_4 alkyl;
and fungicidally active metal complexes or protic acid salts of said compounds.

13. A method for controlling fungus disease which comprises applying to the locus of infestation to be protected an effective amount of a compound of claim 1.

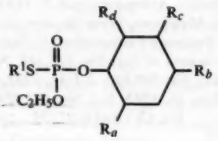
4,496,552

O-HALOPHENYL O-ALKYL S-TERT-BUTYL PHOSPHOROTHIOATES AS PESTICIDES

Mohamed A. H. Fahmy, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 22, 1983, Ser. No. 487,773
Int. Cl.³ A01N *57/14*; C07F *9/165*
U.S. Cl. 514—147 **7 Claims**

1. An O-halophenyl O-ethyl S-alkyl phosphorothioate compound of the formula



in which
R^1 is tertiary butyl,
R_a and R_b are each bromine or chlorine,
R_c is hydrogen, chlorine or bromine,
R_d is hydrogen, chlorine or bromine.

5. A method for control of foliar feeding insects which comprises applying to the above ground portions of a plant an insecticidal amount of the compound of claim 1, 2, 3, or 4.

4,496,553

PHARMACEUTICAL COMPOSITION AND METHOD FOR THE TREATMENT OF COLITIS ULCEROSA AND CROHN'S DISEASE BY ORAL ADMINISTRATION

Soren Halskov, Helsinge, Denmark, assignor to Farmaceutisk Laboratorium Ferring A/S, Vanlose, Denmark

Continuation of Ser. No. 270,517, May 29, 1981, abandoned. This application Nov. 28, 1983, Ser. No. 555,533
Claims priority, application Denmark, Mar. 20, 1980, 1202/80
Int. Cl.³ A61K *9/22, 9/36, 31/60*
U.S. Cl. 514—166 **2 Claims**

1. A method for the treatment of ulcerative colitis or Crohn's disease comprising orally administering an effective amount of a composition consisting essentially of free 5-aminosalicylic acid in admixture with a pharmaceutically acceptable carrier which will control the release of said effective amount of 5-aminosalicylic acid to be administered according to the actual site of said ulcerative colitis or Crohn's disease in an individual patient.

4,496,554

OLEAGINOUS EMOLLIENT VEHICLE FOR STEROID FORMULATIONS

Thomas M. Wong, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 4,100, Jan. 17, 1979, abandoned. This application Oct. 15, 1981, Ser. No. 311,495
Int. Cl.³ A61K *31/56*
U.S. Cl. 514—179 **9 Claims**

1. A composition for the topical administration of an antiinflammatory corticosteroid comprising an effective amount of the corticosteroid and not less than 40% by weight of the composition of isostearyl alcohol.

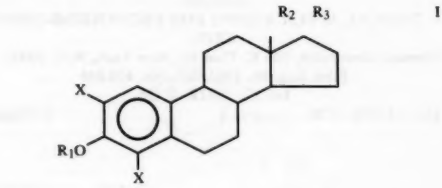
4,496,555

COMPOUNDS AND COMPOSITIONS FOR INHIBITING ESTROGEN SULFOTRANSFERASE TRANSFERASE ACTIVITY, PROCESS AND NOVEL INTERMEDIATES THEREIN

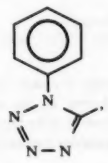
Samuel C. Brooks, Orchard Lake, and Jerome P. Horwitz, Oak Park, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Jul. 19, 1983, Ser. No. 515,335
Int. Cl.³ A61K *31/56*
U.S. Cl. 514—182 **26 Claims**

1. A compound having the formula

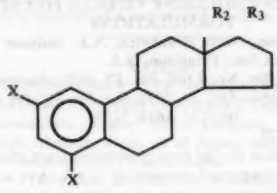


wherein R_1 is
(a) a substituent having the formula



T_1,
(b) perfluoroalkylsulfonyl of from 1–4 carbon atoms, inclusive;
and wherein R_2 and R_3 are the same or different and are
(a) hydrogen,
(b) hydroxy; or
(c) taken together are keto; and
with the proviso that both cannot be hydrogen at the same time; and wherein one of X is
(a) halogen,
(b) nitro,
(c) amino, or
(d) hydroxy; and
with the proviso that the other X must always be hydrogen.

15. A method of treating a female mammal to prevent implantation of a blastocyst which method comprises administering an effective dose of an estrogen sulfotransferase inhibiting compound selected from the group consisting of the formula



XX

wherein R_2 and R_3 are the same or different and are

(a) hydrogen,

(b) hydroxy, or

(c) taken together are keto

with the proviso that both cannot be hydrogen at the same time; and wherein one of X is

(a) halogen,

(b) nitro,

(c) amino, or

(d) hydroxy and with the proviso that the other X must always be hydrogen; and a pharmaceutically acceptable carrier.

4,496,556

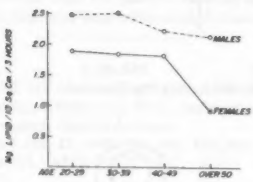
TOPICAL APPLICATIONS FOR PREVENTING DRY SKIN

Norman Orentreich, 140 E. 72nd St., New York, N.Y. 10021

Filed Aug. 16, 1982, Ser. No. 408,548

Int. Cl.³ A61K *31/56*

U.S. Cl. 514—178 **6 Claims**



1. A method of treating dry skin in a patient which comprises topically administering to the area of dry skin on the patient an effective amount of dehydroepiandrosterone and/or a pharmaceutically acceptable, therapeutically effective derivative thereof.

4,496,557

TRICYCLIC ETHERS, THEIR PREPARATION AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Charles Malen, Fresnes, and Jean-Claude Poignant, Bures s/Yvette, both of France, assignors to Adir, Neuilly-sur-Seine, France

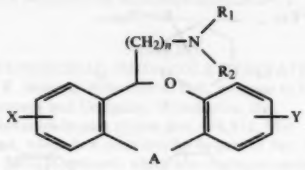
Filed Aug. 16, 1982, Ser. No. 408,451

Claims priority, application France, Aug. 27, 1981, 81 16347

Int. Cl.³ A61K *31/33, 31/335;* C07D *313/12, 267/18*

U.S. Cl. 514—211 **13 Claims**

1. A compound corresponding to the general formula:



(I)

in which

X and Y identical or different, represent a hydrogen or a halogen atom, a lower alkyl, a lower alkoxy or a trifluoromethyl group,

A represents a methylene group or an —NR_3— group in which R_3 is a hydrogen atom or a lower alkyl or lower alkanoyl group

R_1 and R_2 identical or different, each represents a hydrogen atom or a lower alkyl group, or together with the nitrogen atom to which they are attached they form a pyrrolidino, piperidino or 4-methylpiperazino group, and

n represents an integer from 1 to 3, inclusive, n being 2 when NR_1R_2 is a heterocyclic radical, in their racemic or optical isomeric forms, as well as their salts of addition with a therapeutically compatible mineral or organic acid.

8. Method for treating depression in a patient which comprises administering to said patient a therapeutically-effective dose of a compound according to claim **1**.

4,496,558

PHARMACEUTICAL COMPOSITIONS AND METHODS FOR PRODUCING ALPHA ANTAGONISM

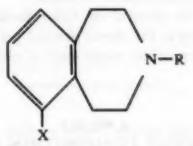
Robert M. DeMarinis, Ardmore; Jacob P. Hieble, Philadelphia, and William D. Matthews, West Chester, all of Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 325,249, Nov. 27, 1981, abandoned, and Ser. No. 398,015, Jul. 14, 1982,. This application Jan. 26, 1983, Ser. No. 461,058

Int. Cl.³ A61K *31/33*

U.S. Cl. 514—213 **13 Claims**

1. A pharmaceutical composition for product alpha$_2$ antagonism comprising a pharmaceutically acceptable carrier and a nontoxic, effective amount to produce said antagonism of a 3-benzazepine compound of the formula:



in which:

R is allyl; and

X is halogen;

or a pharmaceutically acceptable, acid addition salt thereof.

4,496,559

2-SELENOPYRIDINE-N-OXIDE DERIVATIVES AND THEIR USE AS FUNGICIDES AND BACTERICIDES

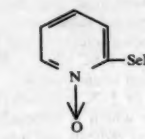
Richard Henderson, Bethany; Eugene F. Rothgery, North Branford, and Hansjuergen A. Schroeder, Hamden, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

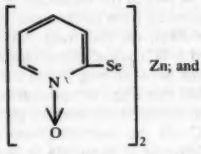
Filed Sep. 2, 1981, Ser. No. 298,679

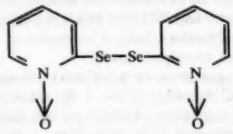
Int. Cl.³ C07D *213/89;* A61K *31/555, 31/44*

U.S. Cl. 514—188 **12 Claims**

1. A derivative of 2-selenopyridine-N-oxide selected from the formulae which consisting of:







5. The method for controlling fungi which comprises contacting said fungi with a fungicidally effective amount of a compound of claim 1.

9. The method for controlling bacteria which comprises contacting said bacteria with bactericidally effective amount of a compound of claim 1.

4,496,560

CEPHALOSPORIN DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Daniel Farge; Pierre Le Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson; Jean-Francois Peyronel, Palaiseau, and Bernard Plau, Creteil, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

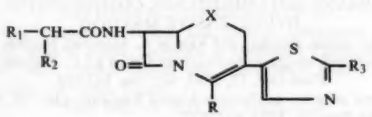
Filed Aug. 16, 1982, Ser. No. 408,676

Claims priority, application France, Aug. 17, 1981, 81 15804

Int. Cl.[3] **C07D** *501/24;* **A61K** *31/545*

U.S. Cl. 514—204 **9 Claims**

1. A cephalosporin of the formula:



in which R_1 represents a radical selected from thienyl, furyl, 1,3-dithiol-2-on-4-yl, phenyl, p-hydroxyphenyl, phenoxy or dichlorophenylthio, and R_2 represents a hydrogen atom; or R_1 represents phenyl or p-hydroxyphenyl and R_2 represents amino; R_3 represents hydrogen, phenyl, alkanoylaminophenyl, alkylthio, alkylamino, dialkylamino or anilino, or R_3 represents alkanoylamino, benzoylamino, thenoylamino, N-alkyl-alkanoylamino, N-alkyl-benzoylamino, N-alkyl-thenoylamino, N-phenyl-alkanoylamino, N-phenyl-benzoylamino, N-phenyl-thenoylamino, alkoxycarbonylamino, dialkylaminoethylamino, dialkylaminomethyleneamino, alkylidenehydrazo, amino-acetamido, 2-aminoethylthio-acetamido or L-2-amino-2-carboxy-ethylthioacetamido, or R_3 represents a radical of the formula —A—R'$_3$, in which A represents —CH_2—, —NH— or —NHCO— amd R'$_3$ represents 1-methyl-3-pyridinio, 1-methyl-4-pyridinio, 1-benzoyl-methyl-3-pyridinio, 1-benzoyl-methyl-4-pyridinio, 1-carboxymethyl-3-pyridinio or 1-carboxymethyl-4-pyridinio; R represents a carboxyl radical or a carboxylato radical if R'$_3$ is a said substituted pyridinio radical; and X represents sulphur or oxygen, it being understood that the alkyl and alkanoyl radicals and moieties mentioned above are straight or branched and contain 1 to 4 carbon atoms each, in its D,L and D, L forms if R_2 is other than a hydrogen atom, and its pharmaceutically acceptable non-toxic metal salts, addition salts with non-toxic nitrogen-containing bases and, where they exist, addition salts with non-toxic acids.

4,496,561

CEPHALOSPORIN DERIVATIVE

Shigeaki Muto, Tokyo; Kouichi Niimura, Sayama; Takao Ando, Tokyo; Akihiko Kanno, Tokyo; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

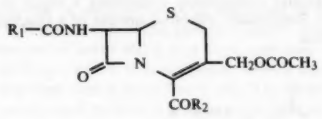
Filed Sep. 16, 1982, Ser. No. 418,762

Claims priority, application Japan, Sep. 22, 1981, 56-149870

Int. Cl.[3] **C07D** *501/20;* **A61K** *31/545*

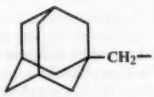
U.S. Cl. 514—209 **8 Claims**

1. A cephalosporin derivative having the formula (I):

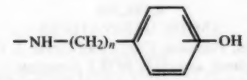


(I)

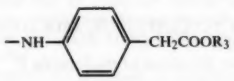
wherein R_1 is



and R_2 is



wherein n is 0, 1 or 2;



wherein R_3 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an alkali metal.

4,496,562

7-SUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID ESTERS

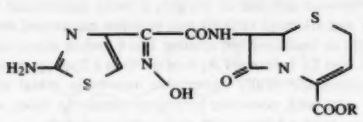
Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Kiyoshi Tsuji, Kishiwada, and Toshiyuki Chiba, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 886,340, Mar. 14, 1978, Pat. No. 4,425,341. This application Dec. 6, 1982, Ser. No. 447,218

Int. Cl.[3] **C07D** *501/22;* **A61K** *31/545*

U.S. Cl. 514—207 **6 Claims**

1. A compound of the formula:



(I)

in which R is lower alkoxycarbonyloxy(lower)alkyl or 1-propionyloxyethyl, or a pharmaceutically acceptable acid addition salt thereof.

4,496,563

FUNGICIDAL THIADIAZINONES

Rolf-Dieter Acker, Leimen; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

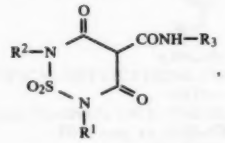
Filed Aug. 18, 1983, Ser. No. 524,202

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3230923

Int. Cl.[3] **C07D** *285/16;* **A61K** *31/54;* **A01N** *43/88*

U.S. Cl. 514—222 **4 Claims**

1. A fungicidal composition comprising a liquid or solid carrier and a fungicidally effective amount of a thiadiazinone of the formula:



(I)

where R^1 and R^2 are identical or different and are each hydrogen, C_1–C_{10}-alkyl, C_3–C_8-cycloalkyl, phenyl or substituted phenyl and R^3 is phenyl or haloalkyl-substituted, alkyl-substituted, alkoxy-substituted, haloalkoxy-substituted or alkyl- and halo-substituted phenyl.

4,496,564

AMIDE DERIVATIVES

Tobias O. Yellin, Fremont, Calif., and David J. Gilman, Macclesfield, England, assignors to ICI Americas Inc., Wilmington, Del. and Imperial Chemical Industries PLC, London, England

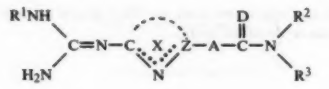
Filed Mar. 1, 1982, Ser. No. 353,423

Claims priority, application United Kingdom, Mar. 9, 1981, 8107272

Int. Cl.[3] **C07D** *239/24;* **A61K** *31/505*

U.S. Cl. 514—237 **9 Claims**

1. A guanidine derivative of the formula I:



I

in which

R^1 is a hydrogen atom or a 1–10C alkyl, 3–8C cycloalkyl, 4–14C cycloalkylalkyl, 3–6C alkenyl, 3–6C alkynyl, 1–6C alkanoyl, phenyl, 7–11C phenylalkyl or benzoyl, the phenyl, phenylalkyl and benzoyl radicals being optionally substituted on the phenyl ring by one or two substituents selected from halogen atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, trifluoromethyl, hydroxy and amino radicals;

in ring X the dotted line is a double bond on one side of the nitrogen atom and Z is a carbon or nitrogen atom such that ring X is a 6-membered aromatic heterocyclic ring and which is a pyrazine, pyridine, pyrimidine or 1,3,5-triazine ring, which heterocyclic ring may, where possible, carry one or two optional substituents, the optional substituents on ring X being selected from fluorine, chlorine and bromine atoms and 1–6C alkyl, 1–6C alkoxy, trifluoromethyl, hydroxy and amino radicals;

—A— is a phenylene or 5–7C cycloalkylene radical or a 1–8C alkylene chain which is optionally substituted by one or two 1–3C alkyl radicals and into which is optionally inserted, as part of the backbone of the chain, one or two groups selected from oxygen and sulphur atoms and NH, 1–6C N-alkyl, cis and trans vinylene, ethynylene, phenylene and 5–7C cycloalkylene radicals, provided that the shortest link between ring X and C=D is of at least 3 atoms, provided that when an optional insertion is made in chain A which results in the inserted group being directly attached to C=D the inserted group is other than an oxygen or sulphur atom or an NH or N-alkyl radical, and provided that no two insertions selected from oxygen and sulphur atoms and NH and N-alkyl radicals are directly attached one to the other;

D is an oxygen or sulphur atom;

R^2 is a hydrogen atom or a hydroxy, amino, 1–6C alkylamino, 1–6C haloalkylamino, 1–6C alkanoylamino, 1–6C alkyl, 3–8C cycloalkyl, 4–12C cycloalkylalkyl, 2–6C alkenyl, 2–6C alkynyl, 1–6C haloalkyl, 1–6C alkoxy, 1–6C hydroxyalkyl, 2–10C alkoxyalkyl, 2–10C alkylthioalkyl, 1–6C aminoalkyl, 2–8C alkylaminoalkyl, 3–12C dialkylaminoalkyl, 2–8C alkanoylaminoalkyl, 8–14C benzoylaminoalkyl, 3–10C alkoxycarbonylalkyl, 2–8C carbamoylalkyl, phenyl, 7–11C phenylalkyl, heteroaryl or heteroarylalkyl radicals, wherein the heteroaryl part is a furan, thiophene, pyrrole, thiazole, oxazole, imidazole, thiadiazole, oxadiazole, triazole, pyrazole, pyridine or pyrimidine ring and wherein, when R^2 is or contains phenyl or heteroaryl ring, that ring is optionally substituted by one or two groups selected from fluorine, chlorine, bromine and iodine atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, 2–6C dialkylamino, 2–6C alkanoyl, trifluoromethyl, hydroxy and amino radicals;

R^3 is a hydrogen atom or R^2 and R^3 are joined to form, together with the nitrogen atom to which they are attached, a pyrrolidine, piperidine, morpholine, piperazine or N-methylpiperazine ring and the pharmaceutically-acceptable acid-addition salts thereof.

4,496,565

CHROMANS AND CHROMENES, COMPOSITIONS AND HYPERTENSIVE METHOD

John M. Evans, Roydon, and Valerie A. Ashwood, Harlow, both of England, assignors to Beecham Group p.l.c., England

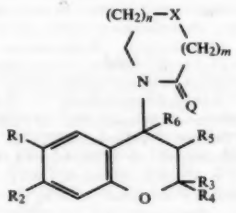
Filed Oct. 17, 1983, Ser. No. 542,658

Claims priority, application United Kingdom, Oct. 19, 1982, 8229789; May 18, 1983, 8313677

Int. Cl.[3] **A61K** *31/425, 31/54;* **C07D** *413/04, 417/04*

U.S. Cl. 514—222 **9 Claims**

1. A compound of formula (I):



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected

from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, C_{1-6} alkyl-thiolmethyl, formyl or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or —C(C_{1-6} alkyl)-NOH or —C(C_{1-6} alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

either R_5 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-8} acyloxy and R_6 is hydrogen or R_5 and R_6 together are a bond;

Q is O or S;

m is an integer from 0 to 2 and n is an integer from 0 to 2 such that m+n is 1 or 2;

X is O or S, or N—R_7, R_7 being hydrogen, C_{1-9} alkyl, C_{2-7} alkanoyl, phenylC_{1-4} alkyl, naphthylcarbonyl, phenylcarbonyl or benzylcarbonyl optionally substituted in the phenyl or naphthyl ring by one or two C_{1-6} alkyl, C_{1-6} alkoxy or halogen; mono- or bi-cyclicheteroarylcarbonyl; the lactam or thiolactam group being trans to the R_5 group when R_5 and R_6 are not a bond; or, when one or the other of R_1 and R_2 is an amino or an amino-containing group, or when X is NR_7 and R_7 is hydrogen, a pharmaceutically acceptable salt or solvate thereof.

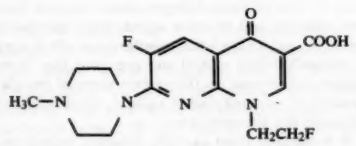
9. A method of treatment of hypertension in mammals including humans comprising the administration of a pharmaceutically effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof to the sufferer.

4,496,566
NAPHTHYRIDINE DERIVATIVES

Jun-ichi Matsumoto, Ikoma, and Shinichi Nakamura, Takatsuki, both of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan and Laboratoire Roger Bellon, Neuilly sur Seine, France

Filed Dec. 21, 1981, Ser. No. 333,181
Claims priority, application Japan, Dec. 24, 1980, 55-184417
Int. Cl.³ A61K *31/495, 31/47;* **C07D** *401/04*
U.S. Cl. 514—254 **3 Claims**

3. A method for the treatment of a bacterial infectious disease which comprises administering to a warm-blooded animal suffering from such disease an antibacterially effective amount of a 1,8-naphthyridine compound of the formula



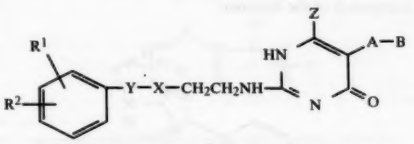
or a non-toxic pharmaceutically acceptable salt thereof.

4,496,567
PHENYL ALKYLAMINOPYRIMIDONES

Thomas H. Brown, Tewin, and Robert J. Ife, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Nov. 6, 1979, Ser. No. 91,850
Claims priority, application United Kingdom, Nov. 13, 1978, 44260/78; Aug. 21, 1979, 7929013
Int. Cl.³ A61K *31/505;* **C07D** *239/36, 401/12, 405/12*
U.S. Cl. 514—272 **10 Claims**

1. A compound of Structure 1



in which R^1 is hydrogen or lower alkoxy; R^2 is in the 3-, 4- or 5-position and is lower alkyl substituted by R^3, or ethoxy or propoxy ω-substituted by R^3 where R^3 is amino, lower alkylamino, di(lower alkyl)amino, N-piperidino or N-pyrrolidino; Y is methylene or oxygen and X is methylene or sulphur provided that one or two of the groups X and Y is methylene; Z is hydrogen or lower alkyl; A is C_1–C_5 alkylene or —$(CH_2)_pW(CH_2)_q$— where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4, and B is 6-methoxy-3-pyridyl, 2-methoxy-4-pyridyl, 6-hydroxy-3-pyridyl or 2-hydroxy-4-pyridyl, in the form of the free base or a pharmaceutically acceptable acid addition salt thereof.

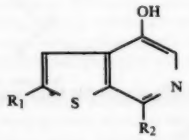
8. A pharmaceutical composition having histamine H_2-receptor blocking activity comprising in an effective amount to block said receptors a compound of claim 1 and a pharmaceutically acceptable diluent or carrier.

4,496,568
ANTIINFLAMMATORY THIENO [2,3-c]PYRIDINE DERIVATIVES

Jean-Pierre Maffrand, and Daniel Frehel, both of Toulouse, France, assignors to PACOR, Paris, France

Filed Apr. 25, 1983, Ser. No. 487,355
Claims priority, application France, Dec. 19, 1977, 77 38308
Int. Cl.³ A61K *31/44;* **C07D** *495/04*
U.S. Cl. 514—301 **21 Claims**

14. A method for the treatment of inflammatory conditions in warm-blooded animals which comprises administering to a warm blooded animal an amount effective for that purpose of a substance selected from the group consisting of thieno(2,3-c)pyridine of the formula



in which R_1 and R_2, which may be the same of different, represent hydrogen or a loweralkyl group, and the pharmaceutically acceptable acid addition salts thereof.

4,496,569
ANTIALLERGIC (1H-TETRAZOL-5-yl)TETRAZOLO[1,5-a]QUINOLINES AND DERIVATIVES THEREOF

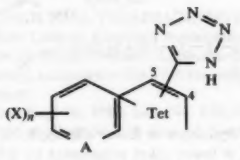
Terry L. Wright, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1983, Ser. No. 478,964

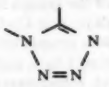
Int. Cl.[3] **A61K** *31/47, 31/44;* **C07D** *471/04, 471/14*

U.S. Cl. 514—311 **13 Claims**

11. A method for inhibiting the results of antibody-antigen reactions in mammals which comprises administration to a mammal susceptible to allergic reaction of an effective amount of a compound of the formula:



wherein Tet is the divalent tetrazolo group of the formula



which is attached to the ring system to give either isomeric form; A is —CH= or —N=; n is 0, 1 or 2; X is H, alkyl or 1–4 C, alkoxy of 1–4 C, halogen, methylmercapto, methylsulfonyl, or two X's can be combined as methylenedioxy; with the proviso that, when X is methylmercapto or methylsulfonyl, then n must be 1; or a pharmaceutically acceptable salt thereof.

4,496,570
4,5αEPOXYMORPHINAN-6-SPIRO-2'-(4'-CARBOXY,1',3'-THIAZOLIDINE)DERIVATIVES

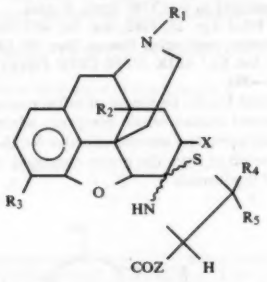
Nicholas S. Bodor, Gainesville, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Mar. 21, 1983, Ser. No. 477,447

Int. Cl.[3] **C07D** *489/08;* **A61K** *31/485*

U.S. Cl. 514—282 **12 Claims**

1. A compound of the structural formula



or its pharmaceutically acceptable salts, wherein

X is H or CH_3,

Z is NH_2 or OR_6,

R_1 is a C_{3-6}-alkenyl or C_{3-6}-cycloalkylmethyl,

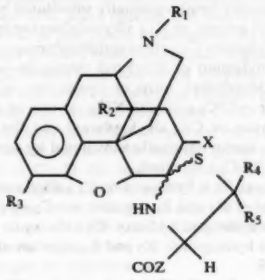
R_2 is hydroxy, chloro or fluoro,

R_3 is hydrogen hydroxy, or —OCO—(C_{1-6}-alkyl),

R_4 and R_5 may be the same or different and are H or C_{1-6} alkyl,

R_6 is C_{1-4} alkyl.

10. Method of producing antagonism to the depressant action of an opioid drug in a mammal in which there is administered to said mammal an effective antagonist dose of a compound of the structural formula



or its pharmaceutically acceptable salts, wherein

X is H or CH_3,

Z is NH_2 or OR_6,

R_1 is a C_{3-6}-alkenyl or C_{3-6} cycloalkylmethyl,

R_2 is hydroxy, chloro or fluoro,

R_3 is hydrogen hydroxy, or —OCO—(C_{1-6}-alkyl),

R_4 and R_5 may be the same or different and are H or C_{1-6} alkyl,

R_6 is C_{1-4} alkyl.

4,496,571
HISTAMINE H2-ANTAGONISTS

Tobias O. Yellin, Fremont, Calif.; David J. Gilman, Tytherington; Philip N. Edwards, Bramhall; Michael S. Large, Congleton; Derrick F. Jones, Tytherington, and Keith Oldham, Cheadle, all of England, assignors to ICI Americas Inc., Wilmington, Del. and Imperial Chemical Industries, PLC, London, England

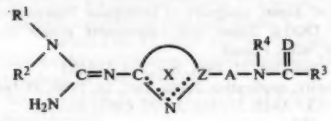
Filed Mar. 1, 1982, Ser. No. 353,422

Claims priority, application United Kingdom, Feb. 27, 1981, 8106376; May 5, 1981, 8113664

Int. Cl.[3] **C07D** *249/04, 401/12;* **A01K** *31/41*

U.S. Cl. 514—340 **10 Claims**

1. A guanidine derivative of the formula I:



I

in which

R^1 and R^2, which may be the same or different, are hydrogen atoms or branched or unbranched 1–10C alkyl, 3–8C cycloalkyl or 4–14C cycloalkyl radicals, each alkyl, cycloalkyl or cycloalkyl alkyl radical being optionally substituted by one or more halogen atoms selected from fluorine, chlorine and bromine atoms, provided that at least one of R^1 and R^2 is a halogen-substituted alkyl, cycloalkyl or cycloalkylalkyl radical and provided that there is no halogen substituent on the carbon atom of the alkyl, cycloalkyl or cycloalkylalkyl radical which is directly attached to the nitrogen atom;

ring X is selected from oxazole, thiazole, imidazole, 1,2,4-thiadizole, 1,2,4-oxadiazole, 1,2,3-triazole, 1,2,4-triazole and pyrazole, and may, where possible, carry one or two

optional substituents, the optional substituents on ring X being selected from fluorine, chlorine, bromine atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, trifluoromethyl, hydroxy and amino radicals;

—A— is a phenylene or a 5–7C cycloalkylene radical or a 1–8C alkylene chain which is optionally substituted by one or two 1–3C alkyl radicals and into which is optionally inserted, as part of the backbone of the chain, one or two groups selected from oxygen and sulphur atoms and NH, 1–6C N-alkyl, cis or trans vinylene, ethynylene, phenylene and 5–7C cycloalkylene radicals, provided that the shortest link between ring X and NR^4 is of at least 3 atoms, provided that when the optional insertion is made in chain A which results in the inserted group being directly attached to NR^4 the inserted group is other than an oxygen or sulphur atom or an NH and N-alkyl radical, and provided that no two insertions selected from oxygen and sulphur atoms and NH and NH and N-alkyl radicals are directly attached one to the other;

D is an oxygen or sulphur atom;

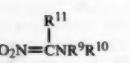
R^3 is a 1–6C alkyl radical which is substituted by one, two or three halogen atoms or by one or two substituents selected from hydroxy, amino, cyano, nitro, carboxy, carbamoyl, 1–6C alkoxy, 1–6C alkylthio 1–6C alkylamino, 2–10C dialkylamino, 1–6C alkanoylamino, phenoxy, heteroaryl, heteroaryloxy, benzoylamino, 1–6C alkanoyl, benzoyl and 2–6C alkoxycarbonyl radicals;

or R^3 is a 2–6C alkenyl radical optionally substituted by one or two radicals selected from carboxy, carbamoyl, cyano, nitro, 2–6C alkoxycarbonyl, phenyl and heteroaryl radicals,

or R^3 is a 2–6C alkynyl, phenyl, 7–11C phenylalkyl or heteroaryl radical or a radical of the formual COR^7 or $CONR^7R^8$ is which R^7 and R^8 are selected from hydrogen atoms and 1–6C alkyl and phenyl radicals,

wherein when R^3 is or contains a heteroaryl radical that radical is furyl, thienyl, pyrazolyl tiazolyl, oxazolyl, imidazolyl, thiazolyl, oxadiazolyl, triazolyl, pynazolyl, pyridyl or pyrimidyl radical, or such a radical fused with a benzene ring;

and wherein R^3 is or contains an phenyl or heteroaryl radical, that radical may optionally by substituted by one or two substituents selected from halogen atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, trifluoromethyl, hydroxy, amino, carbamoyl, 2–6C alkylcarbamoyl, 3–10C dialkylcarbamoyl, phenylcarbamoyl, diphenylcarbamoyl, sulphamoyl, 1–6C alkylsulphamoyl, 2–10C dialkylsulphamoyl, phenylsulphamoyl, diphenylsulphamoyl, 1–6C aminoalkyl, 2–10C alkylaminoalkyl, 3–15C dialkylaminoalkyl, 1–6C hydroxyalkyl and 2–10C alkoxyalkyl radicals and radicals of the formula III:



III

in which R^9 and R^{10} are 1–6C alkyl radicals and R^{11} is a hydrogen atom or R^9 is a 1–6C alkyl radical and R^{10} and $R^{11}$are joined to form, together with the nitrogen and carbon atoms to which they are attached, a pyrrolidine or piperidine ring, and, when the group inseted in A is an ethynylene radical, R^3 may also be a 1–6C alkyl radical;

R^4 is a hydrogen atom or a 1–6C alkyo radical;

and the pharmaceutically-acceptable acid-addition salts thereof.

4,496,572

BENZO-FUSED THROMBOXANE SYNTHETASE INHIBITORS

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

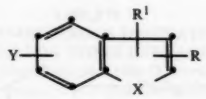
Filed Aug. 9, 1982, Ser. No. 406,140

Claims priority, application United Kingdom, Aug. 26, 1981, 8125976

Int. Cl.[3] **A61K** *31/415, 31/44;* **C07D** *401/06*

U.S. Cl. 514—337 **20 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein

R^1 is hydrogen, F, Cl, Br, I, C_1–C_4 alkyl or —S(C_1–C_4 alkyl);

Y is —COOH, —COO(C_1–C_4 alkyl) or $CONH_2$;

X is O, S, NH or N(C_1–C_4 alkyl); and

R is 1-imidazolylmethyl or 3-pyridylmethyl; with the proviso that said Y is always other than $CONH_2$ when said X is NH or N(C_1–C_4 alkyl).

4,496,573

1-PYRIDYLMETHYL-3-ACYL GUANIDINES

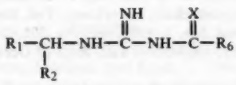
William L. Studt, Harleysville, and Harry K. Zimmerman, Kintnersville, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Aug. 24, 1982, Ser. No. 410,959

Int. Cl.[3] **C07D** *213/53;* **A61K** *31/44*

U.S. Cl. 514—344 **9 Claims**

1. A compound of the formula



wherein:

X is O or S;

R_2 is H or lower alkyl;

R_6 is lower alkyl, cycloalkyl of 3 to 6 carbon atoms, lower alkenyl, lower alkynyl, phenyl lower alkyl or substituted phenyl lower alkyl;

R_1 is pyridyl or pyridyl having 1 to 4 ring substituents selected from the group consisting of halogen, lower alkyl, lower alkenyl, phenyl, lower alkynyl, phenyl lower alkyl, nitro, cyano, sulfonyl, hydroxyl, carboxyl, lower alkanoyl, lower alkoxy, phenyl lower alkoxy, halo lower alkoxy, amido, amino, lower alkanoyloxy, lower alkylamino, lower alkoxyamino, and phenyl lower alkoxyamino;

and the N-oxide thereof;

wherein substituted phenyl means a phenyl group in which one or more hydrogens is replaced by halo, lower alkyl, halo lower alkyl, nitro, amino, lower alkanoylamino, hydroxy, lower alkoxy, phenyl lower alkoxy, lower alkanoyloxy, cyano, halo lower alkoxy or lower alkyl sulfonyl;

or a pharmaceutically acceptable acid addition salt thereof.

4,496,574

PENICILLIN DERIVATIVE

Shigeaki Muto, Tokyo; Kouichi Niimura, Sayama; Takao Ando; Akihiko Kanno, both of Tokyo; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

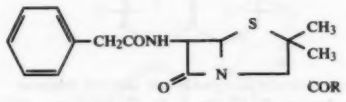
Filed Sep. 16, 1982, Ser. No. 419,077

Claims priority, application Japan, Sep. 22, 1981, 56/149869

Int. Cl.³ A61K *31/43*; C07D *499/40*

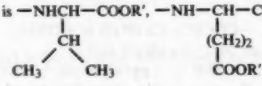
U.S. Cl. 514—195 2 Claims

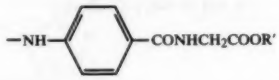
2. An antibacterial composition in a dosage unit form comprising an effective amount of a penicillin derivative having the formula (I):



(I)

wherein R is —NHCH—COOR', —NH—CH—COOR' or





wherein R' is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an alkali metal, and a pharmaceutically acceptable carrier.

4,496,575

FUNGICIDAL N-SULPHENYLATED HYDANTOINS

Engelbert Kühle, Bergisch-Gladbach; Wilhelm Brandes, Leichlingen; Hans-Jürgen Rosslenbroich, Langenfeld, and Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

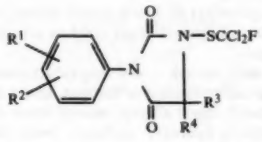
Filed Jun. 3, 1983, Ser. No. 501,034

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222523

Int. Cl.³ A01N *43/50*; C07D *233/82*

U.S. Cl. 514—390 11 Claims

1. An N-sulphenylated hydantoin of the formula



in which:

R^1 is trihalogenomethoxy or trihalogenomethylmercapto,

R^2 is hydrogen, nitro or halogen, and

R^3 and R^4 each independently is hydrogen or alkyl having 1 to 4 carbon atoms, or, together with the ring carbon atom at which they are located, form a five-membered or six-membered cycloalkyl radical.

10. A method of combating fungi which comprises administering to such fungi a fungicidally effective amount of a compound according to claim 1.

4,496,576

COMPOSITIONS OF P-HYDROXYBENZOIC ACID ESTERS AND METHODS OF PREPARATION AND USE

Donald F. Loncrini, Ellisville; Thomas E. Haag, St. Louis County, and Steven R. Freebersyser, Florissant, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 363,026, Mar. 29, 1982, abandoned, which is a continuation of Ser. No. 199,717, Oct. 23, 1980, abandoned. This application Sep. 12, 1983, Ser. No. 531,064

Int. Cl.³ A01N *43/50, 37/10*

U.S. Cl. 514—389 36 Claims

1. A freeze and heat stable composition having broad spectrum antimicrobial activity consisting of a clear solution containing approximately 10% to 90% by weight of a eutectic mixture of three or more lower alkyl esters of p-hydroxybenzoic acid, approximately 10% to 90% by weight of a solution containing 55% of 1,3-bis(hydroxymethyl)-5,5-dimethylhydantoin and 45% of water, and approximately 0.5% to 10% by weight based on the weight of said eutectic mixture and said 1,3-bis(hydroxymethyl)-5,5-dimethylhydantoin solution of an anionic surfactant.

4,496,577

IMIDAZOLIDINONE PROSTAGLANDINS, COMPOSITIONS AND USE

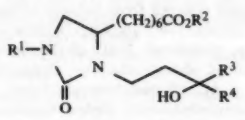
Joseph M. Muchowski, Sunnyvale, Calif., and Angel Guzman, Estro, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 5, 1983, Ser. No. 539,197

Int. Cl.³ A61K *31/415*; C07D *233/02*

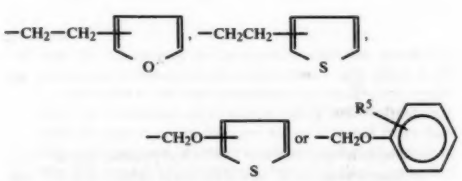
U.S. Cl. 514—392 12 Claims

1. A compound of the formula



(I)

and the pharmaceutically acceptable salts thereof, wherein R^1 and R^2 are independently hydrogen or alkyl of 1 to 4 carbons; R^3 is hydrogen or methyl; and R^4 is $—(CH_2)_nCH_3$ wherein n is 3–7, cycloalkyl of 5–7 carbons, a substituent of the formula



wherein R^5 is hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, halo or trifluoromethyl.

11. A method of inhibiting platelet aggregation which method comprises administering an effective amount of a compound of claim 1 to a mammal either alone or in add mixture with a pharmaceutically acceptable excipient.

4,496,578
ANTIHYPERTENSIVE SULFUR-CONTAINING COMPOUNDS

Jun-ichi Iwao, Takarazuka; Masayuki Oya, Ibaraki, and Tadashi Iso, Tondabayashi, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

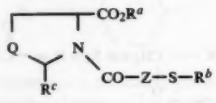
Division of Ser. No. 86,996, Oct. 22, 1979,. This application Jul. 6, 1982, Ser. No. 395,128

Claims priority, application Japan, Oct. 31, 1978, 53-135093; Dec. 14, 1978, 53-155166; Feb. 6, 1979, 54-012519; Feb. 19, 1979, 54-018812

Int. Cl.³ A61K *31/40;* **C07D** *207/16*

U.S. Cl. 514—423 **9 Claims**

1. A compound of the formula (I)



wherein

Q is methylene;

R^a is hydrogen, phenyl, alkoxy-lower alkyl, acyloxy-lower alkyl, imido-lower alkyl or substituted phenyl wherein the substituent(s) is lower alkyl, lower alkoxy, hydroxy, acyl, acyloxy, halogen, nitro, amino, lower alkylamino, acylamino or carboxy;

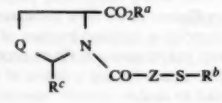
R^b is lower alkyl, aralkyl, lower alkanoyl, cycloalkanecarbonyl, phenyl-lower alkanoyl, pyridylcarbonyl, benzyloxycarbonyl, substituted benzoyl or substituted phenyl-lower alkanoyl wherein the substituent(s) is lower alkyl, halogen or lower alkoxy;

R^c is hydroxyphenyl; and

wherein the lower alkyl groups contain 1 to 6 carbon atoms, lower alkoxy groups contain 1 to 6 carbon atoms, aralkyl groups are phenyl-lower alkyl groups, acyloxy groups are lower alkanoyloxy, benzoyloxy, or benzyloxycarbonyloxy groups, acylamino groups are lower alkanoylamino, benzoylamino, or benzyloxycarbonylamino groups, and acyl group is acetyl or benzoyl groups; and

Z is straight or branched alkylene with 1 to 3 carbon atoms; and salts thereof.

6. A pharmaceutical composition comprising (i) a compound of the formula (I)



wherein

Q is methylene;

R^a is hydrogen, phenyl, alkoxy-lower alkyl, acyloxy-lower alkyl, imido-lower alkyl or substituted phenyl wherein the substituent(s) is lower alkyl, lower alkoxy, hydroxy, acyl, acyloxy, halogen, nitro, amino, lower alkylamino, acylamino or carboxy;

R^b is lower alkyl, aralkyl, lower alkanoyl, cycloalkanecarbonyl, phenyl-lower alkanoyl, pyridylcarbonyl, benzyloxycarbonyl, substituted benzoyl or substituted phenyl-lower alkanoyl wherein the substituent(s) is lower alkyl, halogen or lower alkoxy;

R^c is phenyl, furyl, thienyl, pyridyl, naphthyl, substituted phenyl, substituted furyl, substituted thienyl, substituted pyridyl or substituted naphthyl wherein the substituent(s) is lower alkyl, hydroxy, lower alkoxy, acyloxy, mercapto, acylmercapto, halogen, nitro, amino, lower alkylamino, acylamino, lower alkylenedioxy or carboxy; and

wherein the lower alkyl groups contain 1 to 6 carbon atoms, lower alkoxy groups contain 1 to 6 carbon atoms, aralkyl groups are phenyl-lower alkyl groups, acyloxy groups are lower alkanoyloxy, benzoyloxy, or benzyloxycarbonyloxy groups, acylamino groups are lower alkanoylamino, benzoylamino, or benzyloxycarbonylamino groups, acylmercapto groups are lower alkanoylmercapto, or benzoylmercapto groups, and acyl group is acetyl or benzoyl groups; and

Z is straight or branched alkylene with 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof;

in an amount sufficient to reduce blood pressure, and

(ii) at least one pharmaceutically acceptable excipient.

4,496,579
BENZODIOXINOPYRROLE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Andrew J. Crame, Greenford, and Alan D. Borthwick, London, both of England, assignors to Glaxo Group Limited, London, England

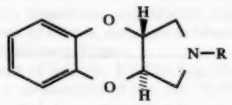
Filed Oct. 25, 1983, Ser. No. 545,191

Claims priority, application United Kingdom, Oct. 25, 1982, 8230379

Int. Cl.³ A61K *31/40;* **C07D** *209/48*

U.S. Cl. 514—411 **11 Claims**

1. A compound selected from the group consisting of compounds of formula (I):



(I)

wherein R is a hydrogen atom or a C_{1-6} alkyl (optionally substituted by C_{3-7} cycloalkyl), C_{3-6} alkenyl, C_{3-6} alkynyl, C_{3-7} cycloalkyl, aralkyl (in which the alkyl moiety contains 1–5 carbon atoms), or —CHO group,

and physiologically acceptable salts thereof.

9. A α_2-adrenoreceptor antagonist composition comprising a compound selected from the group consisting of compounds of formula (I), physiologically acceptable salts thereof and their mixtures together with a physiologically acceptable carrier or excipient.

4,496,580
OXOTHIENOBENZOXEPINS

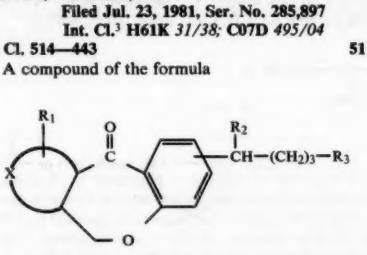
Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jul. 23, 1981, Ser. No. 285,897

Int. Cl.³ H61K *31/38;* **C07D** *495/04*

U.S. Cl. 514—443 **51 Claims**

1. A compound of the formula



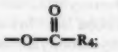
(I)

where X together with the carbon atoms to which it is attached is a thiophene ring;

R_1 is hydrogen, a straight or branched chain alkyl group having 1 to 5 carbon atoms or a halogen atom;

R_2 is hydrogen or a straight chain alkyl group having 1 to 5 carbon atoms; and

R_3 is hydroxyl or



where R_4 is a straight chain or branched chain alkyl group having 1 to 10 carbon atoms, a phenyl group or a trifluoromethyl group.

4,496,581

1,2-DIBROMO-2-CYANO-2-(HETEROCYCLIC)ALKANE COMPOUNDS AND ANTIMICROBIAL USE THEREOF

John E. Engelhart, Westfield; Marshall R. Angeles, Scotch Plains, both of N.J., and Michael J. D'Errico, Flossmoor, Ill., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1981, Ser. No. 333,277

Int. Cl.³ C07D *307/14, 333/12*

U.S. Cl. 514—438 **7 Claims**

1. 1,2-dibromo-2-cyano-3-(2-thienylpropane).

5. An antimicrobial composition comprising a carrier and an antimicrobially effective amount of a compound selected from the group consisting of 1,2-dibromo-2-cyano-3-(2-thienylpropane); 1,2-dibromo-2-cyano-2-(2-thienylethane); 1,2-dibromo-2-cyano-3-(3-furanylpropane); and 1,2-dibromo-2-cyano-2-(4-furanylethane)

4,496,582

ANALGESIC DIBENZ[b,f]OXEPINS

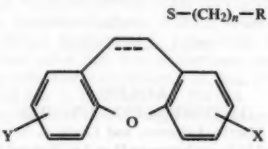
Helen H. Ong, Whippany, and Matthew J. Flynn, North Plainfield, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Dec. 12, 1983, Ser. No. 560,717

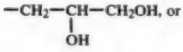
Int. Cl.³ A61K *31/335;* **C07D** *313/14*

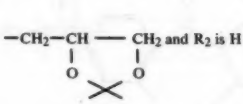
U.S. Cl. 514—450 **38 Claims**

1. A compound depicted by the formula



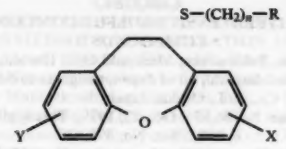
wherein n is an odd integer 1–7 inclusive; R is $-CO_2R_1$ or $-CH_2OR_2$ where R_1 is H, C_{1-15} lower alkyl, aralkyl,



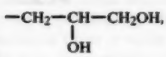


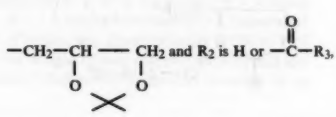
R_3 being C_{1-5} lower alkyl; X and Y are each independently hydrogen, halogen, trifluoromethyl, C_{1-5} lower alkoxy, C_{1-5} lower alkyl, C_{1-5} lower alkylthio, or hydroxy; and the dotted line ( ) may be a bond or nothing.

36. An analgesic composition which comprises an effective pain alleviating amount of a compound depicted by the formula



wherein n is an odd integer 1–7 inclusive; R is $-CO_2R_1$ or $-CH_2OR_2$ where R_1 is H, C_{1-5} lower alkyl, aralkyl,





R_3 being C_{1-5} lower alkyl; X and Y are each independently hydrogen, halogen, trifluoromethyl, C_{1-5} lower alkoxy, C_{1-5} lower alkyl, C_{1-5} lower alkylthio, or hydroxy; and the dotted line ( ) may be a bond or nothing.

4,496,583

PAPER-LIKE POLYESTER FIBER SHEET AND PROCESS FOR PRODUCING THE SAME

Tamio Yamamoto; Tsukasa Kobayashi, both of Matsuyama; Tadashi Hirakawa, Kusatsu; Makoto Yoshida, Ibaraki, and Masumi Okumura, Joyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 278,073, Jun. 29, 1981, abandoned.

This application Feb. 24, 1983, Ser. No. 469,578

Claims priority, application Japan, Jul. 7, 1980, 55-91663; Jul. 11, 1980, 55-93900; Nov. 11, 1980, 55-157628; Nov. 12, 1980, 55-158149

Int. Cl.³ D21F *11/00;* **D04H** *1/58*

U.S. Cl. 428—288 **21 Claims**

1. A paper-like polyester fiber sheet, comprising polyester staple fibers and having a coefficient of air flow resistance of from 2,500 to 23,500 $dyn.s/cm^4$ at a volume fraction of the fibers of from 0.01 to 0.24, said polyester staple fibers containing drawn polyester staple fibers each having a denier of 0.01 to 0.9 and a length of from 0.3 to 20 mm.

4,496,584

AMIDINE DERIVATIVES WITH ANTI-COMPLEMENT ACTIVITY

Setsuro Fujii, Toyonaka; Takashi Yaegashi; Toyoo Nakayama, both of Funabashi; Shigeki Nunomura, Chiba; Yojiro Sakurai, Kamakura, and Toshiyuki Okutome, Tokyo, all of Japan, assignors to Torii & Co. Ltd., Tokyo, Japan

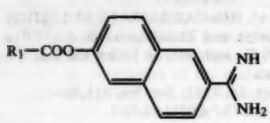
Filed Apr. 21, 1982, Ser. No. 370,647

Claims priority, application Japan, Apr. 28, 1981, 56-64943

Int. Cl.³ C11C *3/04;* **C07C** *69/035;* **A61K** *31/27, 31/23*

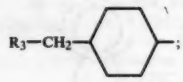
U.S. Cl. 514—510 **2 Claims**

2. An anti-complement agent comprising as an active ingredient an effective anti-complement amount of an amidine derivative represented by the formula (I) or a pharmaceutically acceptable acid addition salt thereof:



(I)

wherein R_1 represents a straight-chain or branched-chain alkyl group of 1 to 17 carbon atoms, a straight-chain or branched-chain alkenyl group of 2 to 6 carbon atoms having 1 to 3 double bonds, $R_2—(CH_2)_n—$, $R_3—(CH_2)_m—$, or



R_2 represents a cycloalkyl group of 3 to 6 carbon atoms or a cycloalkenyl group of 3 to 6 carbon atoms having 1 or 2 double bonds; n is 0, 1, 2 or 3; R_3 represents an amino or guanidino group or a protected amino or guanidino group; and m is an integer of 1 to 5;

and a pharmaceutically acceptable carrier therefor.

4,496,585

POWDERED OR GRANULAR SOLID PESTICIDE COMPOSITION

Mamoru Yoshida, Odawara; Hidejiro Yokoo, Tokyo, and Ei Shirai, Omiya, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 515,832

Claims priority, application Japan, Jul. 21, 1982, 57-125872

Int. Cl.³ A01N *47/46, 47/48*

U.S. Cl. 514—514 **4 Claims**

1. A powdered or granular solid pesticide composition comprising 0.05 to 0.5 parts by weight of methyl isothiocyanate supported on 1 part by weight of natural or synthetic faujasite type zeolite particles having an effective micro-pore diameter of 3.5 to 4.2 angstroms.

4,496,586

CYCLOPROPANECARBOXYLATES, THEIR PRODUCTION AND INSECTICIDE CONTAINING THEM AS AN ACTIVE INGREDIENT

Masanao Matsui; Liau Chun-Eng, both of Tokyo; Kunio Kogami, Machida; Toshihiko Yano, Ikoma, and Noritada Matsuo, Itami, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

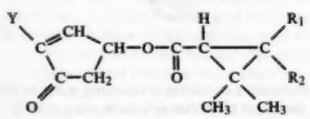
Continuation of Ser. No. 306,376, Sep. 28, 1981, Pat. No. 4,496,586

Claims priority, application Japan, Oct. 9, 1980, 55-141799; Dec. 19, 1980, 55-181012; Dec. 19, 1980, 55-181013

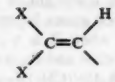
Int. Cl.³ C07C *69/747, 69/743*

U.S. Cl. 514—531 **3 Claims**

1. A compound of the formula



wherein R_1 is a hydrogen atom, R_2 is a group of the formula,



in which X is a methyl group.

4,496,587

INHIBITION OF BACTERIAL TOXIN RELEASE BY PROSTAGLANDINS

Harold E. Renis, Portage, and Mary J. Ruwart, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 293,899, Aug. 18, 1981, abandoned. This application Apr. 29, 1983, Ser. No. 488,528

Int. Cl.³ A61K *31/19*

U.S. Cl. 514—573 **9 Claims**

1. A method of preventing the release of toxins from bacteria capable of releasing a toxin which comprises contacting the bacteria with an amount of an antitoxic, non-antibicrobial, and non-bacteriacidal prostaglandin effective to prevent toxin release.

4,496,588

METHOD OF TREATING PSORIASIS

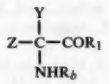
Philippe Bey, Strasbourg, and Michel Jung, Illkirch-Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Continuation of Ser. No. 373,198, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 28,758, Apr. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 814,765, Jul. 11, 1977, abandoned. This application Apr. 28, 1983, Ser. No. 487,243

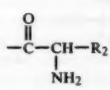
Int. Cl.³ A61K *31/195*

U.S. Cl. 514—564 **10 Claims**

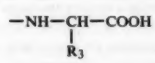
1. A method of treating psoriasis in a patient in need thereof which comprises administering to said patient an effective amount of a compound of the formula



wherein Y is $FCH_2—$, $F_2CH—$, $F_3C—$, $ClCH_2—$, or $Cl_2CH—$; Z is γ-guanidinopropyl or $R_aHN(CH_2)_n—$; n is the integer 3 or 4; each of R_a and R_b is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched, or the group



wherein R_2 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $—NR_4R_5$ wherein each R_4 and R_5 is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms, or the group



wherein R_3 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; with the provisos that when Z is γ-guanidinopropyl, Y is FCH_2—, F_2CH—, or F_3C— and R_1 is hydroxy; and the lactams thereof when Z is $R_aHN(CH_2)_n$— and each of R_a and R_b is hydrogen; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,496,589

ANTI-INFLAMMATORY, DISINFECTANT AND ANTI-BACTERIAL COMPOUND

Leonardo De Vincentiis, Rome, Italy, assignor to Ausonia Farmaceutici s.r.l., Rome, Italy

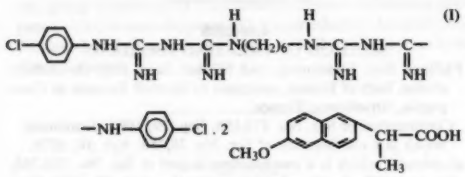
Filed Nov. 4, 1982, Ser. No. 439,067

Claims priority, application Italy, Nov. 26, 1981, 25298 A/81

Int. Cl.[3] **C07C** *143/63, 129/08;* **A61K** *31/155*

U.S. Cl. 514—565 **3 Claims**

2. Pharmaceutical compositions, for topical use having anti-inflammatory, disinfectant and anti-bacterial activity, containing 1–10% by weight of (+)-6-methoxy-α-methyl-2-naphthalene acetate of N,N''-bis (4-chlorophenyl)-3,12-diimino-2,4,11,13-tetraazatetradecan-diimidoamide possessing formula



(I)

and at least one member selected from the group consisting of carriers, excipients, adjuvants and dispersants.

4,496,590

BENZYL ALCOHOL DERIVATIVES, THEIR PREPARATION AND USE

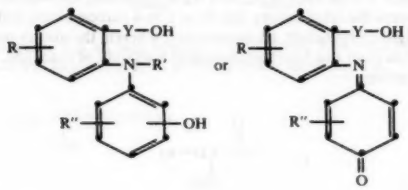
Donald C. Schlegel, Schodack, and Malcolm R. Bell, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Apr. 18, 1983, Ser. No. 485,936

Int. Cl.[3] **A01N** *33/02;* **A61K** *31/335;* **C07C** *50/10, 97/10*

U.S. Cl. 514—646 **20 Claims**

1. A compound of the formula



wherein:

R is hydrogen, lower-alkyl, lower-alkoxy or halo;

R' is hydrogen or lower-alkyl;

R'' is hydrogen, lower-alkyl or halo; and

Y is C_nH_{2n} wherein n is an integer from 1 to 2.

17. A composition for the treatment or prevention of allergic asthma which comprises an anti-asthmatically effective amount of a compound according to claim 1 together with one or more pharmaceutically acceptable excipients or diluents.

19. A method for treating or preventing allergic asthma in a mammal which comprises administering to said mammal a composition according to claim 17.

4,496,591

INSECTICIDAL BIS-CARBAMATE SULFIDES

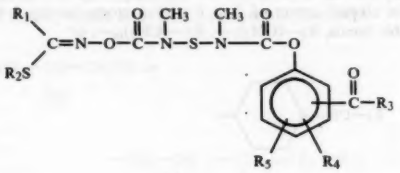
John A. Durden, Raleigh, and Themistocles D. J. D'Silva, Chapel Hill, both of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 14, 1981, Ser. No. 311,306

Int. Cl.[3] **C07C** *69/013*

U.S. Cl. 514—477 **15 Claims**

1. A compound of the formula:



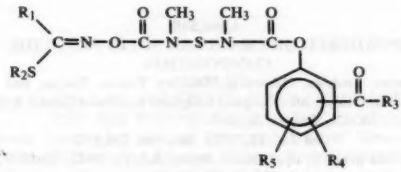
wherein:

R_1 and R_2 independently are C_{1-4} alkyl

R_3 is hydrogen, C_{1-4} alkyl or a phenyl group; and

R_4 and R_5 independently are hydrogen, C_{1-4} alkyl or alkoxy.

11. A method of controlling insects and nematodes which comprises subjecting them to an insecticidally or nematocidally effective amount of a compound of the formula:



wherein:

R_1 and R_2 independently are C_{1-4} alkyl

R_3 is hydrogen, C_{1-4} alkyl or a phenyl group; and

R_4 and R_5 independently are hydrogen, C_{1-4} alkyl or alkoxy.

4,496,592

PROCESS FOR PRODUCING CHEWING GUM IN THE FORM OF COMPOSITE FIBERS

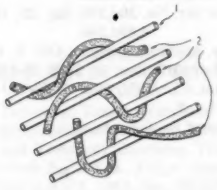
Rikiya Kuwahara; Akinaka Habuto, both of Kanagawa, and Hisayoshi Oiso, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed May 18, 1983, Ser. No. 495,876

Claims priority, application Japan, Oct. 5, 1982, 57-173924

Int. Cl.[3] **A23G** *3/30*

U.S. Cl. 426—5 **15 Claims**



1. A process for producing a chewing gum in the form of composite fibers, which comprises feeding (A) a sweetener selected from the group consisting of sugar, a sugar mixture, candy and mixtures thereof, wherein said candy is formed from a combination of sugars which is boiled to a candy, after optionally adding water thereto, and (B) a chewing gum base or

a chewing gum composition into a fiberizing section of a candy floss making machine which is heated to a temperature sufficient to permit said materials to melt or to be maintained in a molten state, thereby to form composite fibers of said materials, wherein the proportion of the chewing gum base or the chewing gum base portion of the chewing gum composition is 0.2 to 1.5 parts by weight per part by weight of at least one of sugar and candy.

4,496,593

ROLLED CHEESE AND PROCESS FOR PRODUCING THE SAME

Michel Caillé, Sainte-Solange, France, assignor to Laiteris Hubert Triballat, d'Angilion, France

Continuation of Ser. No. 247,208, Mar. 24, 1981, abandoned. This application Nov. 26, 1982, Ser. No. 444,382

Claims priority, application France, Apr. 8, 1980, 80 07844

Int. Cl.³ A23C *19/00*; A23P *1/00*

U.S. Cl. 426—89 **11 Claims**

1. A rolled cheese consisting essentially of:

a layer of non-kneaded, uncooked, fresh curds and a layer of herbs placed upon the layer of fresh curds with both layers rolled together in a spiral, said rolled cheese being produced by a process consisting essentially of:

(a) molding uncooked fresh curds into a continuous, unbroken, non-kneaded curd layer, said curds having a solids content in the range of approximately 35% to less than 40% by weight,

(b) placing a coating of flavoring on the molded curd layer;

(c) rolling the curd layer and the coating together into a spiral to produce a rolled product, the coating being surrounded by the curd layer; and

(d) draining the rolled product at a temperature in the range of 5° C.–7° C.

4,496,594

METHOD OF HEATING AND PACKAGING FOOD

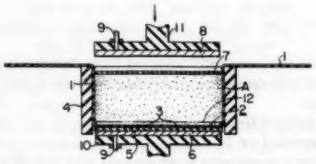
Kingo Miyahara, Tokyo, Japan, assignor to Dowa Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 367,635, Apr. 12, 1982, abandoned. This application Oct. 14, 1983, Ser. No. 541,477

Claims priority, application Japan, Apr. 21, 1981, 56-59975; Apr. 21, 1982, 56-59976

Int. Cl.³ A23L *3/32*

U.S. Cl. 426—234 **1 Claim**



1. A method of producing packaged food comprising:

placing a single planar flexible sheet of heat resisting and insulating packing film down into the interior of a cylindrical insulating container completely open at the top and bottom, a portion of said single sheet having a plurality of current passing apertures, which apertures are formed substantially in the center thereof, and wherein said sheet lines the interior surface of the container with the edges of the sheet extending over and beyond the container top, and the portion of said sheet having a plurality of current apertures lies against a first salt solution impregnated electrical contact member provided at the open bottom of said container supported by a first electrode plate;

filling said single heat resisting sheet lined container with unprocessed foodstuff;

placing a second salt solution impregnated electrical contact member abutting a second electrode in the top of said container in pressing contact directly against said foodstuff;

passing an electrical current between said two electrode plates and through said foodstuff, salt impregnated contact member and plurality of current passing apertures of the single sheet, so that said unprocessed foodstuff is ripened and sterilized;

removing said second electrode plate and salt solution impregnated electrical contact member from said foodstuff; and

wrapping said processed foodstuff with the edges of said single heat resisting sheet.

4,496,595

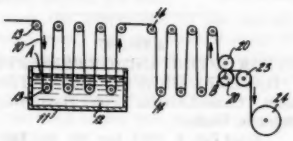
METHOD FOR PRODUCING SMOKE COLORED AND SMOKE FLAVORED ENCASED FOODSTUFF

Myron D. Nicholson, Lockport, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 417,173, Sep. 14, 1982, Pat. No. 4,431,033, which is a continuation-in-part of Ser. No. 312,366, Oct. 16, 1981, abandoned. This application Nov. 30, 1983, Ser. No. 556,441

Int. Cl.³ A22C *11/00, 13/00*; A23L *1/22*

U.S. Cl. 426—284 **15 Claims**



1. A method for producing a smoke colored and smoke flavored foodstuff comprising the steps of: providing a tar-containing aqueous liquid smoke solution comprising a mixture of smoke coloring and smoke flavoring constituents having an absorptive power of at least about 0.25 at 340 nm. wave length and an organic liquid solvent which is either nonreactive with said liquid smoke solution or reactive with said liquid smoke solution to form a derivative liquid solvent, said liquid solvent being immiscible in the liquid smoke solution and having a hydrogen bonding solubility parameter in the liquid smoke environment of at least about 2.7; contacting said liquid smoke solution and said liquid solvent in a volume ratio between about 1:1 and 65:1 of liquid smoke solution to liquid solvent, under extraction conditions to form a tar-enriched liquid solvent fraction and a tar-depleted liquid smoke fraction; separating the fractions to provide said tar-depleted liquid smoke as an aqueous liquid smoke composition; treating a surface of a tubular food casing with said tar-depleted aqueous liquid smoke composition in sufficient quantity to provide an absorptive index of at least about 0.2 at 340 nm. wave length for the casing wall; stuffing the so-treated casing with foodstuff and processing the resulting encased foodstuff under conditions sufficient to transfer smoke color and smoke flavor constituents from the casing to the encased foodstuff.

4,496,596

AROMATIZING METHOD

Oscar W. Stoeckli, Rye, N.Y., and David J. Berry, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

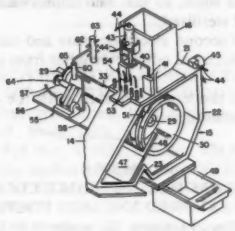
Division of Ser. No. 220,927, Dec. 29, 1980, Pat. No. 4,355,571. This application Mar. 16, 1982, Ser. No. 358,757

Int. Cl.³ A23F *5/46*

U.S. Cl. 426—388 **4 Claims**

1. A method for aromatizing a mass of adsorbent coffee particulates with a carrier oil enriched with a coffee aroma, comprising the steps of, feeding said coffee particulates onto

the surface of a circular member having a peripheral groove formed therein, rotating said member to advance the particulates contained within said groove from an in-feed position to a discharge position to form a continuously moving ribbon of coffee particulates, scraping from the surface of said member



said particulates other than that contained within said groove during the advance rotation thereof between said positions, and injecting into the continuously moving ribbon of coffee particulates within said groove before reaching said discharge position, a predetermined amount of said carrier oil enriched with coffee aroma.

4,496,597

PROCESS FOR DRYING AND/OR PRESERVING FRUITS HAVING A HIGH SUGAR CONTENT

Bruno Régès, "Cante-Lausette" Pinel Hauterive, 47380 Monclar d'Agenais, France

Filed Feb. 8, 1982, Ser. No. 346,540
Int. Cl.³ A23B *7/00, 7/02*
U.S. Cl. 426—402 **5 Claims**

1. A process for drying and preserving a hygroscopic fruit to avoid sugaring consisting essentially of:

(a) dehydrating said hygroscopic fruit at a temperature of 55° to 80° C. for a period of about 16 hours until the water content of the fruit is not more than 40% nor less than about 29%;

(b) tightly packing the partially dehydrated fruit in its prevailing condition and temperature at the end of step (a) into sterile containers to minimize the amount of air present in said containers and, hermetically sealing said containers;

(c) heating the confined partially dehydrated fruit in said hermetically sealed containers at a temperature of 75° to 80° C. for three to four hours to avoid thermal shock when heating is stopped and the product cooled to ambient temperature and subsequently storing said container at room temperature until time of use.

4,496,598

PROCESS FOR PREPARING MUSTARD FLOUR

Shiro Sakai, No. 4-15-9, Nakamachi, Urawa-shi, Saitama-ken, Japan, and Etsuo Ebisawa, Soka, Japan, assignors to Shiro Sakai and Sumiko Sakai, both of Saitama, Japan

Filed Oct. 7, 1982, Ser. No. 433,218
Claims priority, application Japan, Oct. 8, 1981, 56-159432
Int. Cl.³ A23L *1/225;* **C11B** *1/06*
U.S. Cl. 426—417 **7 Claims**

1. A process for producing flour from mustard seed comprising the steps of:

(a) compressing mustard seeds at a temperature below about 65° C. and at a pressure above about 1,000 Kg/cm², sufficient to remove oil therefrom;

(b) heating the so-compressed seeds under conditions to decrease the activity of myrosinase enzyme in the seeds and thereby suppress pungency; and then

(c) grinding the so-treated seeds to produce a mustard flour of reduced pungency and enhanced preservability.

4,496,599

PROCESS FOR PRODUCING DEFATTED AND DEBITTERED SOYBEAN MEAL

Keith H. Steinkraus, Geneva, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Mar. 10, 1983, Ser. No. 474,104
Int. Cl.³ A23J *1/14*
U.S. Cl. 426—430 **5 Claims**

1. A process for preparing particulate, organolepically bland, defatted, debittered soybean product having improved water solubility and reduced phospholipid content, said process comprising the sequential steps of

(a) extracting utilizing a polar solvent by:

(1) contacting flaked or pulverized dehulled, unheated, raw soybeans with an extracting medium consisting of an undilute lower alkanol polar solvent for a time period in the range of 15 minutes to two hours;

(2) separating a substantial amount of the polar solvent together with extractants leaving partially defatted particulate soybean product;

(b) extracting the product resulting from step (a) utilizing an extracting medium consisting of a non-polar solvent in a plurality of extraction steps to leave less than 0.4 percent fat associated with the product, the last of the extraction steps utilizing non-polar extraction solvent which is essentially fat-free;

(c) desolventizing the product of step (b) to substantially remove residual solvents.

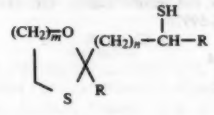
4,496,600

FLAVORING WITH 2-MERCAPTOALKYL OXATHIOLANES AND OXATHIANES

Thomas H. Parliment, New City, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,470
Int. Cl.³ A23L *1/231;* **C07D** *327/04, 327/06*
U.S. Cl. 426—535 **7 Claims**

1. A foodstuff containing a compound having a structure selected from the group consisting of:



wherein:

each R is independently selected from the group consisting H and a hydrocarbon chain having from C_1 to C_4 carbon atoms;

η is an integer from 0 to 3; and

m represents 1 or 2,

wherein the compound is in an amount of 0.1 to 50 ppm on an as-consumed foodstuff basis.

4,496,601

PROCESSING FOR PREPARING A COATING MIX CONTAINING A FRIED COMPONENT

Joseph M. Rispoli, Massepequa Park; Morris A. Rogers, Mt. Vernon; Haig H. Sergenian, Yonkers, all of N.Y.; John S. Swartley, Westport, and Harry Topalian, Weston, both of Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,445
Int. Cl.³ A21D *10/00*
U.S. Cl. 426—554 **12 Claims**

1. A process for preparing a dry coating mix which is effective to impart the texture, taste and appearance of deep fat fried foods to baked foodstuffs comprising the steps of:

(a) forming an aqueous, flour-based batter containing from

50 to 80% by weight of water, from 5 to 30% by weight of flour and from 5 to 20% by weight of starch;

(b) forming the batter into particles having a diameter of from about 1.0 to 2.0 mm;

(c) frying said particles in a vegetable oil having a temperature of from about 320° to 440° F.;

(d) removing the fried particles from the oil and removing excess oil from the surface of the particles;

(e) blending the fried particles with other coating ingredients at a level of from 10 to 50% by weight of the mix.

4,496,602

IMITATION BUTTERMILK DRY BLEND SUITABLE FOR RECONSTITUTION WITH MILK

Donald E. Miller, Norcross, Ga.; Cecilia Gilmore, Strongsville, Ohio; Steven R. Dimler, Bexley, Ohio, and Charles E. Werstak, Medina, Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Nov. 2, 1983, Ser. No. 547,894
Int. Cl.³ A21D *10/00;* A23L *1/09*
U.S. Cl. 426—555 **8 Claims**

1. A non-dairy, fat-free dry blend suitable for reconstitution with milk to provide an imitation buttermilk product having the same color, flavor, consistency and texture as natural buttermilk, comprising

a major amount of maltodextrin having a dextrose equivalent less than about 20;

about 2.5–3.5% of a milk soluble hydrocolloid gum;

an acidifying amount, effective on reconstitution with milk, to provide a pH in the range of about 4.2–4.6, of a food grade acid, of which a flavoring amount is acetic acid;

the remainder being flavorants and colorants;

said major amount of maltodextrine, with other ingredients of the dry blend, being an effective amount which, on rehydration with milk in the approximate weight proportion of about 92% milk to about 8% dry blend, provides a viscosity in the range of about 200–500 cps.

4,496,603

PROCESS FOR PRODUCING PECTIN JELLY

Masatoshi Manabe, Kagawa, and Toshio Miyake, Okayama, both of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed May 31, 1983, Ser. No. 501,068
Claims priority, application Japan, Jul. 24, 1982, 57-129482
Int. Cl.³ A23L *1/06;* A23C *9/154*
U.S. Cl. 426—577 **9 Claims**

1. A process for producing a glycosylsucrose-containing pectin jelly, comprising:

providing an aqueous mixture containing at least high-methoxyl pectin, glycosylsucrose and organic acid; and

gelatinizing the mixture at a pH in the range of 3.3–3.5,

wherein the final concentration of said high-methoxyl pectin is in the range of 0.7–2.0% and the final concentration of said glycosylsucrose is in the range of 50–75%.

4,496,604

POWDERY INSTANT MILK COMPOSITION AND METHOD OF PRODUCING THE SAME

Tooichi Otsubo, Tokyo, Japan, assignor to The National Federation of Dairy Co-Operative Associations, Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,872
Claims priority, application Japan, Jan. 6, 1982, 57-800
Int. Cl.³ A23C *9/152*
U.S. Cl. 426—588 **14 Claims**

1. A powdery instant milk composition having a crumb structure, which contains 0.5 to 3% by weight of propylene glycol.

4,496,605

PROCESS FOR PRODUCING BLACK BARLEY MALT EXTRACT

Ronald G. Targan, 80 Main St., West Orange, N.J. 07052

Filed Sep. 19, 1983, Ser. No. 533,733
Int. Cl.³ C12C *1/18;* A23L *1/28*
U.S. Cl. 426—655 **11 Claims**

1. A process for producing a black barley malt extract comprising the steps of:

(a) Crushing a black barley malt having a Lovibond Tintometer reading greater than 400 and a moisture content of from about 1.5 to 2.5 percent by weight, said black barley malt having been made from substantially fully grown and fully germinated barley;

(b) Separating hulls from the crushed black barley malt;

(c) Combining the crushed black barley malt with water in a ratio of from about 4 to 5.5 gallons of water per pound of crushed black barley malt;

(d) Heating the mixture of the crushed black barley malt and water to a temperature of about 120° F.;

(e) Maintaining the temperature of the mixture of crushed black barley malt and water at about 120° F. for about 1 hour;

(f) Heating the mixture of the crushed black barley malt and water to a temperature of about 200° F. at a rate of about 20 Fahrenheit degrees per hour;

(g) Maintaining the temperature of the mixture of the crushed black barley malt and water at about 200° F. for about 2 hours to produce a black barley malt wort;

(h) Agitating the mixture of the crushed black barley malt and water during steps (e), (f) and (g);

(i) Cooling the black barley malt wort to a temperature of about 180° F.;

(j) Separating undissolved solids from the black barley malt wort; and

(k) Concentrating the black barley malt wort to produce a black barley malt extract.

4,496,606

GUAR GUM FOOD BAR

Jane Michnowski, Little Ferry, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Apr. 29, 1983, Ser. No. 489,974
Int. Cl.³ A23L *1/04*
U.S. Cl. 426—658 **9 Claims**

1. A ready-to-eat guar gum dietetic food bar comprising: approximately 50–75% carbohydrates, 10–15% protein, 8–15% fat and 8–12% guar gum by weight, based on the total weight of the product.

4,496,607

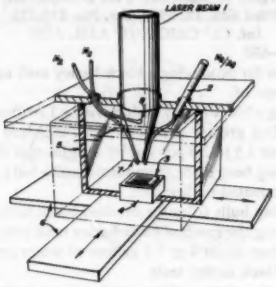
LASER PROCESS FOR PRODUCING ELECTRICALLY CONDUCTIVE SURFACES ON INSULATORS

Eckart Mathias, Catonsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jan. 27, 1984, Ser. No. 574,391
Int. Cl.³ B05D *3/06, 5/12*
U.S. Cl. 427—53.1 **7 Claims**

1. A method of producing electrically conductive surfaces on insulator surfaces characterized in that it uses a laser beam

to melt tracks onto said insulator surfaces which are simultaneously impacted upon by conductive particles which, upon



fusibly bonding to said molten insulator surface, constitute an electrical conductor.

4,496,608

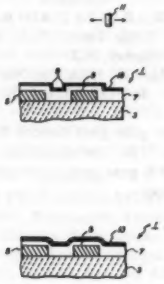
P-GLASS REFLOW TECHNIQUE

David K. Biegelsen, Portola Valley, and Eric R. Sirkin, Mountain View, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1984, Ser. No. 585,678

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—53.1 **3 Claims**



1. A method for reflowing a P-glass layer which comprises:

(a) overcoating said P-glass layer with a radiation absorbing material whose reflectivity increases upon melting;

(b) exposing said radiation absorbing material to radiation to heat said radiation absorbing material to its melting point; and

(c) continuing the radiation exposure of said radiation absorbing material until said P-glass layer has reflowed, said P-glass layer being heated at least in part by conduction of heat from said radiation absorbing material.

4,496,609

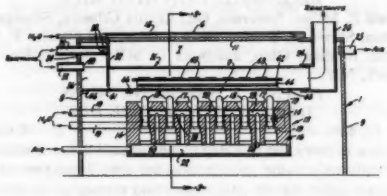
CHEMICAL VAPOR DEPOSITION COATING PROCESS EMPLOYING RADIANT HEAT AND A SUSCEPTOR

Michael A. McNeilly, and Walter C. Benzing, both of Saratoga, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 109,044, Jan. 2, 1980, abandoned, which is a continuation of Ser. No. 608,878, Aug. 29, 1975, abandoned, which is a continuation of Ser. No. 310,444, Nov. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 195,505, Nov. 3, 1971, abandoned, which is a division of Ser. No. 866,473, Oct. 15, 1969, Pat. No. 3,623,712. This application Oct. 22, 1981, Ser. No. 313,814

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—55 **6 Claims**



1. In a process for effecting chemical vapor deposition coating of a substrate in a reaction chamber, the steps of: placing the substrate in the reaction chamber on a susceptor of substantially greater size than the substrate and adapted to absorb and conduct radiant heat energy, transmitting radiant heat energy through a wall of the reaction chamber to the susceptor to heat the susceptor by absorption of the radiant heat energy without appreciable absorption of said energy by the chamber wall, maintaining the substrate in contact with the susceptor to permit a transfer of heat between the susceptor and the substrate whereby the substrate is heated and maintained at a substantially uniform temperature throughout, and introducing a gaseous reactant into the reaction chamber for contact with the heated substrate to form a film by chemical vapor deposition thereon.

4,496,610

ELECTROLUMINESCENT PANELS AND METHOD OF MANUFACTURE

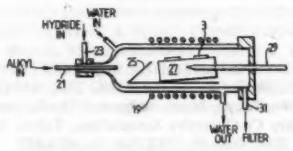
Alan F. Cattell; Brian Cockayne, both of Malvern; Peter J. Wright, Lower Wick, and John Kirton, Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 22, 1983, Ser. No. 477,853

Claims priority, application United Kingdom, Mar. 25, 1982, 8208734; Oct. 18, 1982, 8229683

Int. Cl.³ B05D *5/06, 5/12*

U.S. Cl. 427—66 **7 Claims**



1. A method for the manufacture of an electroluminescent panel wherein manganese doped zinc chalcogenide phosphor film is grown by exposing a heated electrode bearing substrate to alkyl zinc vapour and a gaseous hydride of one of the chal-

cogen elements sulphur or selenium, in the presence of tricarbonyl alkylcyclopentadienyl manganese vapor.

4,496,611

PROCESS FOR IMPROVING WEATHER RESISTANT ADHESION OF A COATING TO GLASS SURFACE

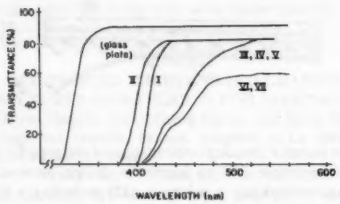
Fumio Kawakubo; Toshifumi Hirose; Tadashi Minokami, all of Kobe; Miyako Hosaka, Miki, and Katsuhiko Isayama, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 228,953, Jan. 27, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,162

Claims priority, application Japan, Jan. 29, 1980, 55-9511

Int. Cl.³ B05B *5/00;* **B05D** *1/36, 5/06, 7/00*

U.S. Cl. 427—160 **3 Claims**



1. A process for improving the weather resistant adhesion of a cured coating to a glass surface, which process consists of the steps of coating a primer composition comprising a film forming component and an ultraviolet light absorbing component, onto a glass surface to form a film capable of substantially shielding light having a wavelength of 380 nm or less; and thereafter, coating a curable composition on top of said primer film; wherein said curable composition is a sealant selected from the group consisting of a modified silicone type sealant, a urethane type sealant, and a polysulfide type sealant; and wherein said ultraviolet light absorbing component comprises 0.5 to 35 weight percent; and wherein said film forming component is selected from the group consisting of silicon modified diallyl phthalate prepolymer, silicon modified epoxy resin, silicon modified acrylic polymer and mixtures thereof.

4,496,612

AQUEOUS FLUX FOR HOT DIP METALIZING PROCESS

James E. McNutt, Wilmington; Robert J. Scott, Newark, and Charles W. Welch, New Castle, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 369,076, Apr. 6, 1982, abandoned. This application Dec. 27, 1983, Ser. No. 565,773

Int. Cl.³ B05D *3/04;* **B23K** *35/34*

U.S. Cl. 427—310 **10 Claims**

1. A flux consisting essentially of 91 to 98.5 percent by weight zinc chloride, from 1.5 to 9 percent by weight ammonium chloride and, based on zinc chloride and ammonium chloride, from 0.6 to 3 percent by weight fluoride ions.

4,496,613

AQUEOUS MEDIA FOR THE TREATMENT OF WOOD AND WOODEN MATERIALS AND A PROCESS FOR SUCH TREATMENT

Hans-Dieter Zagefka, Haltern; Wilfried Bartz, and Alfred Konietzny, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Jan. 13, 1983, Ser. No. 457,551

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1982, 3200782

Int. Cl.³ B05D *1/18;* **C08F** *8/32*

U.S. Cl. 427—440 **23 Claims**

21. In a method of deeply penetrating wood or a wooden material by applying thereto an impregnation composition consisting essentially of a wood preservative and a water-soluble or water-dispersible, oxidatively drying, organic binder based on a low-molecular weight, 1,3-butadiene homo- or co-polymer, wherein the wood or wooden material has open pores by which the composition may penetrate the wood or wooden material,

the improvement wherein the binder is a polymer carrying quaternary ammonium groups and is obtained by,

reacting an epoxy-group-containing, 1,3-butadiene homo- or co-polymer, wherein the basic polymer is made up of ≧70 mole % of 1,3-butadiene monomer units with an amine,

and then reacting the product of this amination with a low-molecular weight monoepoxide so that 0.05–0.5 mole of the quaternizable amino groups is quaternized per 100 g of the amination product,

and wherein the amine reacted with the epoxy-group-containing polymer is a secondary or primary aliphatic amine of the formula

$$R^1\text{-NH-}R^2$$

wherein R^1 and R^2, independently, each is

alkyl, hydroxyalkyl, or alkoxyalkyl, each of 1–7 carbon atoms, the OH or alkoxy not being in the α-position, or R^1 has the meaning above and R^2 is hydrogen.

4,496,614

COMPOSITION FOR DECORATIVE GRASS

Erwin H. Weder; Donald E. Weder, and Herbert A. Weder, all of Highland, Ill., assignors to Highland Manufacturing & Sales Company, Highland, Ill.

Division of Ser. No. 247,108, Mar. 24, 1981, Pat. No. 4,401,700. This application Jun. 23, 1983, Ser. No. 506,902

Int. Cl.³ A41G *1/00*

U.S. Cl. 428—7 **2 Claims**

1. A colored, non-toxic, resinous packaging material for direct food contact packaging which comprises a major amount of resin and a minor amount of a color formulation dispersed throughout said resin, said formulation comprising a pigment insoluble in said resin and selected from the group consisting of organic pigments and FD&C pigments, said formulation further comprising a metal stearate, a non-toxic oil and glycerol monooleate.

4,496,615

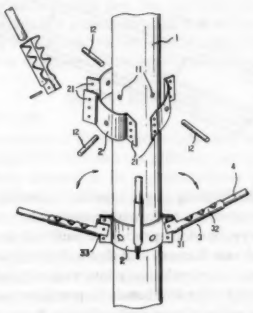
COLLAPSIBLE PLASTIC TREE

Herbert P. H. Huang, No. 1, Hsin-Hsing St., Shu Lin, Taipei Hsien, Taiwan

Filed Nov. 9, 1983, Ser. No. 550,132

Int. Cl.³ A47G *33/06*

U.S. Cl. 428—9 **2 Claims**



1. An improved collapsible plastic tree comprising:
a plastic trunk in the form of a cylindrical tube;

a plurality of collars each having a number of curved plates mounted to said trunk, each of said curved plates being formed with two flat portions each joined to a flat portion of another one of said curved plates to form a junction;

a plurality of ribs, each formed at one end with a serrated portion and at the other end with a U-shaped portion having an edge designed to limit the outward extent of the rib, said U-shaped portion being pivoted on the junction of two of said curved plates in such a way that said rib will swing to its outstretched, upswept position when said plastic trunk is vertically disposed and will collapse when said plastic trunk is inverted; and

a plurality of plastic branches, each tightly wrapped in the serrated portion of each said rib.

4,496,616

STRIP OF HEAT-RECOVERABLE ARTICLES

Robert H. McLoughlin, Highworth, nr. Swindon, and Stanley W. Kirkham, Swindon, both of England, assignors to Raychem Limited, England

Filed Mar. 15, 1982, Ser. No. 358,496

Claims priority, application United Kingdom, Mar. 23, 1981, 8109047

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—36 **9 Claims**

1. A strip of heat-recoverable articles formed by bonding together at intervals two superposed lengths of thermoplastic organic polymeric material, in which strip adjacent articles are connected together by elongate tear welds in the organic polymeric material, the welds extending transversely of the strip and permitting individual articles to be torn off, the articles being interconnected by a passage extending along the strip which passage is capable of conveying fluid pressure into the articles during expansion thereof.

4,496,617

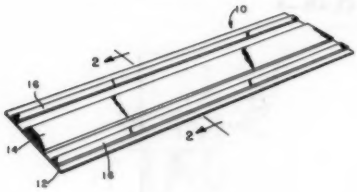
ADHESIVE BINDING STRIP

Kevin P. Parker, 2015 Del Norte St., Berkeley, Calif. 94707

Filed Jun. 1, 1983, Ser. No. 499,914

Int. Cl.³ B42D *1/00*

U.S. Cl. 428—55 **10 Claims**



1. A device for binding pages together comprising:

an elongated substrate of formable material;

a first adhesive band disposed on said substrate along a longitudinal axis thereof, said first adhesive band comprising a heat-activated relatively low viscosity adhesive; and

second and third adhesive bands disposed on said substrate on opposite sides of said first adhesive band, said second and third adhesive bands comprising a heat-activated relatively high viscosity adhesive and having a thickness which is at least one-half the thickness of said first adhesive band.

4,496,618

HEAT TRANSFER SHEETING HAVING RELEASE AGENT COAT

Vincent S. Pernicano, 2833 Railroad St., Boyne Falls, Mich. 49713

Filed Sep. 30, 1982, Ser. No. 430,835

Int. Cl.³ B32B *3/18*; B41M *3/14*

U.S. Cl. 428—201 **21 Claims**

1. A heat transfer sheeting combination of the type for being applied to an article (10) to imprint a design thereon, said combination comprising: a substrate (12) including a fibrous material (24), a design coating disposed on said substrate (12); and an adhesive layer (22) disposed on said design coating for adhesively securing said design coating to the article (10) and characterized by said substrate (12) including a releasing agent coat (32) disposed between said design coating and said substrate (12) for facilitating the removal of said substrate (12) from said design coating after the application thereof onto the article (10), said fibrous material (24) having fibers individually coated by said releasing agent coat (32) to define a matrix of coated fibers.

4,496,619

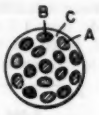
FABRIC COMPOSED OF BUNDLES OF SUPERFINE FILAMENTS

Miyoshi Okamoto, Takatsukishi, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 249,846, Apr. 1, 1981, Pat. No. 4,381,335, which is a continuation of Ser. No. 91,161, Nov. 5, 1979, abandoned. This application Nov. 16, 1982, Ser. No. 442,177

Int. Cl.³ B32B *33/00*; D02G *3/00*; D03D *27/00*

U.S. Cl. 428—224 **3 Claims**



1. A fabric comprising an aggregation of a plurality of bundles of superfine filaments, each such bundle being obtained by separating multi-component composite filaments, each such bundle comprising at least two different kinds of superfine filaments, each such kind of superfine filament being a single component filament dispersed independently without maldistribution in said bundle, said bundle being further characterized by having a difference in coefficient of free contraction between the respective kinds of superfine filaments of at least 5%.

4,496,620

OPAQUE ORIENTED NON-THERMOPLASTIC POLYMER FILM AND METHOD OF FORMING SAME

Hee C. Park, Fairport, and Charles R. Ashcraft, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 25, 1983, Ser. No. 555,254
Int. Cl.³ B32B 3/26, 7/02
U.S. Cl. 428—323 16 Claims

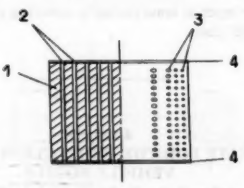
1. An opaque, oriented non-thermoplastic polymer film containing a strata of voids therein, positioned at least substantially within at least a substantial number of said voids, is at least one at least generally spherical void-initiating, solid particle which is phase-distinct and incompatible with said polymer, the void occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximately a corresponding cross-sectional dimension of said void, the population of voids in said film being such as to cause opacity.

4,496,621

REINFORCED IMPREGNATED GRAPHITE STRUCTURES AND PROCESS FOR MAKING SAME

Jean-Marie Hubert; Jean-Michel Bauer, and Serge Mollet, all of Pagny sur Moselle, France, assignors to Le Carbone-Lorraine, Courbevoie, France

Filed May 27, 1983, Ser. No. 498,735
Claims priority, application France, May 28, 1982, 82 09327
Int. Cl.³ B32B 5/02
U.S. Cl. 428—236 9 Claims



1. A shaped resin impregnated graphitic article having on at least a part of its surface a reinforcement formed of fibers of carbon, graphite, glass, silica, alumina or boron, impregnated with a resin, said resin integrally uniting said article and said reinforcement, prepared by the process comprising;

a. covering at least a part of said surface of said shaped graphitic article with said fibrous reinforcement,

b. impregnating the resulting assembly with a resin, and

c. allowing said resin to harden.

4,496,622

ARTICLE COATED WITH A SULFUR STABILIZED OXIDIZED POLYOLEFIN AND ASPHALT COMPOSITION

Irving B. Chang, and Robert E. Beckwith, Jr., both of Morristown, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 528,826, Sep. 2, 1983,. This application Jun. 22, 1984, Ser. No. 623,303
Int. Cl.³ D04H 1/08
U.S. Cl. 428—280 6 Claims

1. An article comprising

a substrate;

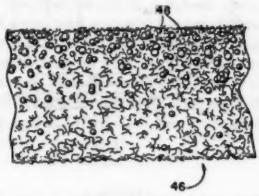
a coating on the substrate wherein the coating comprises asphalt, 1 to 25 weight percent based on the weight of the asphalt of an oxidized polyethylene having a Brookfield viscosity at 149° C. of from 100 to 40,000 centipoises, from 0.1 to 10 percent by weight based on the weight of the asphalt of sulfur, 0 to 40 percent by weight based on the weight of the asphalt of an initial viscosity modifier, and 0 to 150 percent by weight based on the weight of the asphalt of a filler.

4,496,623

BUOYANT FIBER PRODUCT

Richard Fraige, 11005 Hwy. 50 E., Carson City, Nev. 89701

Division of Ser. No. 337,122, Jan. 5, 1982,. This application Aug. 22, 1983, Ser. No. 524,871
Int. Cl.³ B32B 5/16
U.S. Cl. 428—283 24 Claims



1. A buoyant, readily water-permeable and therefore heat-convection-transparent, but wave-retarding fiber product for use in waterbeds to deter wave action; said product comprising:

a large multiplicity of lofted fibers, in the form of a matting that is readily water-permeable throughout;

a large multiplicity of buoyant particles spaced apart among the fibers to maintain the said readily water-permeable condition; and

a binder disposed on said fibers and on said particles, said binder causing substantially each of said fibers to be bound to at least one other fiber, respectively, and substantially each of said particles to be bound to at least one of said fibers, respectively;

said binder causing the material to be set in said lofted, readily water-permeable condition; whereby it is particularly adapted to float within and near the top of such waterbeds and to retard waves therein.

4,496,624

FIBROUS WEB IMPREGNATED WITH COAGULATED POLYURETHANE AND POLYOLEFIN ADMIXTURE

John R. McCartney, Westtown, Pa., assignor to Norwood Industries, Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 398,260, Jul. 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 188,329, Sep. 18, 1980, Pat. No. 4,376,148, and Ser. No. 188,330, Sep. 18, 1980, Pat. No. 4,342,805. This application Jan. 10, 1984, Ser. No. 569,754
Int. Cl.³ B32B 5/06
U.S. Cl. 428—288 24 Claims

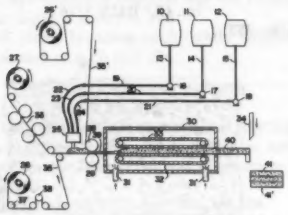
17. An impregnated fibrous web comprised of a fibrous web having impregnated therein a coagulated homogeneous admixture of anionic dispersion of a polyurethane polymer and a compatible anionic, cationic or nonionic dispersion or emulsion of a polymer selected from the group consisting of neoprene, polyvinyl chloride, polyacrylate polymers, polyolefin polymers and polyfloroolefin polymers wherein said polymers are water soluble in their coagulated state; said coagulated polymers are present at a level of 30 to 65 percent by weight based on the total weight of polymer in the impregnated fibrous web and said impregnated fibrous web having a uniform density throughout.

4,496,625

ALKOXYLATED AROMATIC AMINE-AROMATIC POLYESTER POLYOL BLEND AND POLYISOCYANURATE FOAM THEREFROM

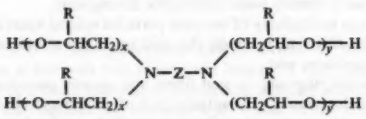
Scott C. Snider, Pinellas Park, and Alberto DeLeon, Clearwater, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Oct. 12, 1983, Ser. No. 541,197
Int. Cl.³ B32B 3/26, 5/18
U.S. Cl. 428—318.4 42 Claims



1. A laminate comprising at least one facing sheet adhered to a polyisocyanurate foam which comprises the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol blend comprising

(a) about 5 percent to about 95 percent by weight of said blend of an alkylene oxide adduct of an aromatic amine of the formula



wherein Z is a divalent aromatic radical, x, x', y, and y' each independently have an average value from about 1 to about 5, and each R is independently selected from the group consisting of hydrogen, alkyl or aryl, provided that the adduct is capped with ethylene oxide units, and

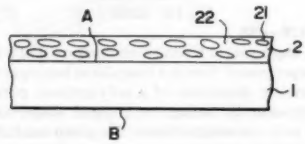
(b) about 5 percent to about 95 percent by weight of said blend of an aromatic polyester polyol material having a molecular weight of from about 150 to about 5,000.

4,496,626

MAGNETIC RECORDING MEDIUM

Akira Kasuga; Noburo Hibino, and Hajime Miyatsuka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 23, 1982, Ser. No. 351,561
Claims priority, application Japan, Mar. 12, 1981, 56-35832
Int. Cl.³ G11B 5/74, 5/64, 5/68
U.S. Cl. 428—336 9 Claims



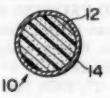
1. A magnetic recording medium which comprises a non-magnetic substrate and a magnetic layer provided on said non-magnetic substrate and containing, as main constituents, ferromagnetic grains and a binder, wherein the surface roughness of the non-magnetic substrate surface on the side adjoining said magnetic layer is 0.007μ or more and is higher than the surface roughness of the back surface of said non-magnetic substrate which is 0.02μ or less.

4,496,627

ELECTRICAL CONDUCTIVE FOAM BEADS AND MOLDED ELECTRICAL CONDUCTIVE FOAMED ARTICLES OBTAINED THEREFROM

Tadashi Azuma; Yoshihiro Akamatsu, both of Tokyo; Hiroyuki Akiyama, Hiratsuka, and Shohei Yoshimura, Tomioka, all of Japan, assignors to Fujimori Kogyo Co., Ltd. and Japan Styrene Paper Corporation, both of Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,191
Claims priority, application Japan, Nov. 25, 1981, 56-187864; Nov. 30, 1981, 56-191930; Jan. 6, 1982, 57-747
Int. Cl.³ B32B 15/02, 3/06
U.S. Cl. 428—336 20 Claims



1. An electrical conductive foam bead comprising a foamed bead core of a thermoplastic synthetic resin and an electrical conductive layer at least partially covering the surface of said foamed bead core.

4,496,628

LAMINATE FOR THE PROTECTION OF MOTOR VEHICLE BODIES

John H. Deatcher, Lake Peekskill, and Jagadish C. Goswami, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 20, 1983, Ser. No. 515,403
Int. Cl.³ C09J 7/02
U.S. Cl. 428—337 15 Claims

1. A laminate adapted for the protection of motor vehicle bodies from abrasion and corrosion damage when secured thereto which consists essentially of:

(a) a film component having a thickness of at least about 200 microns comprising an internally plasticized vinyl chloride copolymer resin and an effective amount of a polymeric additive to enhance the flexibility characteristics of the film; and

(b) a layer of pressure sensitive adhesive attached to one side of the film.

4,496,629

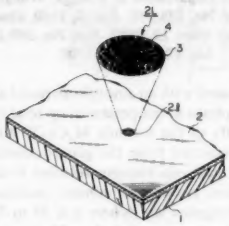
MATERIAL USED TO BEAR WRITING OR PRINTING

Masahiro Haruta, Funabashi, and Takashi Hamamoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1983, Ser. No. 456,381
Claims priority, application Japan, Jan. 12, 1982, 57-3004; Jan. 12, 1982, 57-3005
Int. Cl.³ B32B 5/16
U.S. Cl. 428—341 9 Claims

1. A material suitable for printing with ink which material comprises a substrate and a coating layer thereon, said coating

layer including a plurality of micro-cracks having the capability of passing liquid therethrough.



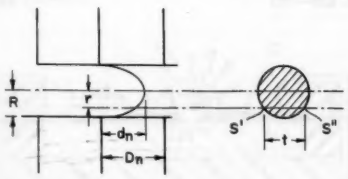
2. A material according to claim 1, wherein said coating layer is formed by coating said substrate with a coating material to give a dry coating weight of 1–10 g/m^2.

4,496,630

POLYAMIDE FIBERS HAVING IMPROVED PROPERTIES AND THEIR PRODUCTION

Kazuo Kurita, Otsu, and Hideaki Ishihara, Uji, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 4, 1983, Ser. No. 464,089
Claims priority, application Japan, Feb. 6, 1982, 57/18021
Int. Cl.^{3} D02G *3/00*
U.S. Cl. 428—364 **12 Claims**



1. A stretched polyamide fiber excellent in strength, which is characterized by having a relative viscosity of not less than 2.3 (measured on a 96% by weight sulfuric acid solution having a polyamide concentration of 10 mg/ml at 20° C.), having an index of birefringence in section which satisfies the following relationship:

$$\Delta n_A - \Delta n_B < 0$$

(wherein Δn_A is the index of birefringence of fiber at the position of $r/R=0.9$, Δn_B is the index of birefringence of fiber at the position of $r/R=0.0$, R is the radius of the fiber section and r is the distance from the central axis of the fiber section), and showing the following physical constants:

Index of birefringence of fiber (Δn) (measured after 24 hours under the conditions of 30° C. and 80% relative humidity) $\geqq 50\times10^{-3}$;

Break strength not less than 12 g/d;

Fiber long period spacing value at length by small angle X-ray diffraction $\geqq$ 100 Å;

Specific gravity $\geqq$ 1.140;

Dry heat shrinkage $\leqq$ 15%; Monofilament denier of less than 35 d

said polyamide being selected from the group consisting of polycapramide, polyhexamethylene adipamide, polyhexamethylene sebacamide, copolymers of the monomeric components of the aforestated polyamides, and condensation products of diamines and linear aliphatic dicarboxylic acids.

4,496,631

ACRYLIC FIBERS FOR PRODUCING CARBON FIBERS

Yasuo Adachi, Ehime, and Kiyoyuki Nabae, Iyo, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,290
Claims priority, application Japan, May 26, 1982, 57-88210
Int. Cl.^{3} D02G *3/00*
U.S. Cl. 428—394 **6 Claims**

1. Acrylic fibers for producing carbon fiber, which have deposited thereon an aqueous oil composition comprising at least one compound selected from the group consisting of phosphate of stearyl alcohol, ethylene oxide adduct of stearyl alcohol containing about 20 to about 40 mols of ethylene oxide, ethylene oxide adduct of oleyl alcohol containing about 20 to about 40 mols of ethylene oxide, ethylene oxide adduct of behenyl alcohol containing about 20 to about 40 mols of ethylene oxide, ethylene oxide adduct of isopentacosanyl alcohol containing about 20 to about 40 mols of ethylene oxide, stearyl glyceride and stearic, oleic or sorbitan-oleic ester of polyalkylene ether glycol having a molecular weight of about 400 to about 1,000; an organic anti-oxidant; and a linear-chain organo silicone, as necessary ingredients.

4,496,632

PROCESS FOR LUBRICATING SYNTHETIC FIBERS

Ronald L. Camp, Riverview; Edward M. Dexheimer, and Basil Thir, both of Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 16, 1982, Ser. No. 450,173
Int. Cl.^{3} B32B *27/34;* C10M *1/20*
U.S. Cl. 428—395 **27 Claims**

1. The process of lubricating thermoplastic synthetic fibers wherein problems presented by interaction of the lubricant with the polyurethane elastomers used in fiber processing machines are eliminated or substantially reduced comprising the application to said fibers of a modified polyoxyalkylene polyol which polyol is modified by capping all of the hydroxyl groups with benzyl, aryl, substituted benzyl, or substituted aryl groups or alkyl groups having 1 to 4 carbon atoms.

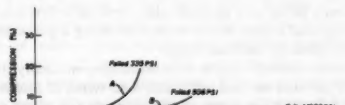
16. A lubricated thermoplastic, synthetic fiber selected from the group consisting of polyester, nylon, poly(benzimidazole), carbon or glass fiber wherein the lubricant is one which eliminates or substantially reduces problems presented by interacting of the lubricant with the polyurethane elastomers used in the fiber processing machinery and comprises a modified polyoxyalkylene polyol which is modified by capping all hydroxyl groups with benzyl, aryl, substituted benzyl or substituted aryl groups or alkyl groups having 1 to 4 carbon atoms.

4,496,633

HIGH DENSITY LOAD BEARING INSULATION PEG

Jeffert J. Nowobilski, Orchard Park, and William J. Owens, Kenmore, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 1, 1983, Ser. No. 547,561
Int. Cl.^{3} B32B *15/00*
U.S. Cl. 428—426 **20 Claims**



1. An insulating peg having a density of 30 to 80 pounds per cubic foot produced by a process comprising:

(A) providing a stack of substantially binderless glass fiber

sheets in an amount sufficient to achieve an insulation peg of desired density from 30 to 80 pounds per cubic foot;

(B) providing a press to compress the stack;

(C) heating the stack and the press to a temperature in the range of from the glass strain temperature to less than the glass softening temperature for a time sufficient to achieve thermal equilibration of the stack and the press surface;

(D) thereafter compressing the stack by applying a light vertically compressive force of from 2.0 to 20.0 pounds per square inch to the stack for a time period sufficient to produce said desired density and to substantially relieve stress within the compressed stack; and

(E) cooling the compressed glass fiber stack to ambient temperature.

10. A process for producing an insulation peg having a density of from 30 to 80 pounds per cubic foot comprising:

(A) providing a stack of substantially binderless glass fiber sheets in an amount sufficient to achieve an insulation peg of desired density from 30 to 80 pounds per cubic foot;

(B) providing a press to compress the stack;

(C) heating the stack and the press to a temperature in the range of from the glass strain temperature to less than the glass softening temperature for a time period sufficient to achieve thermal equilibration of the stack and the press surface;

(D) thereafter compressing the stack by applying a light vertically compressive force of from 2.0 to 20.0 pounds per square inch to the stack for a time period sufficient to produce said desired density and to substantially relieve stress within the compressed stack; and

(E) cooling the compressed glass fiber stack to ambient temperature.

4,496,634

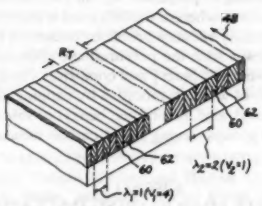
DIFFRACTION GRATING WIRE ARRAYS IN PARALLEL

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 320,995, Nov. 13, 1981,. This application Dec. 5, 1983, Ser. No. 558,123

Int. Cl.[3] **C22B** *61/00, 9/00*

U.S. Cl. 428—611 **4 Claims**



1. A diffraction grating situate on a substrate comprising a plurality of eutectic fine wire arrays in parallel, said grating comprising:

(a) a first region of substantially mutually parallel wires situated on said substrate, said wires of said first region having a composition substantially corresponding to at least one phase of a eutectic alloy system, a first interwire spacing and a first width measured along a plane parallel to the plane of said substrate;

(b) at least a second region of substantially mutually parallel wires situated on said substrate, said wires of said second region having the same composition as the wires of said first region, a second interwire spacing and a second width measured along a plane parallel to the plane of said substrate, said second region being adjacent to said first region, the wires of said second region being substantially parallel to the wires of said first region; and

(c) a transition region between said first and second regions.

4,496,635

AMORPHOUS METAL ALLOY AND COMPOSITE

Rong Wang, and Martin D. Merz, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 138,951, Apr. 9, 1980, abandoned. This application Mar. 19, 1982, Ser. No. 360,117

Int. Cl.[3] **B32B** *15/00*

U.S. Cl. 428—680 **9 Claims**

2. A substrate coated with an amorphous metal alloy capable of remaining amorphous at temperatures up to at least 400° C., consisting essentially of the formula $M_aCr_bT_c$ where M is at least one element selected from the group consisting of iron and nickel, T is at least one element selected from the group consisting of titanium, zirconium, hafnium, niobium, tantalum, molybdenum and tungsten and where a is 35 to 75 atom percent, b is 5 to 20 atom percent, c is 5 to 55 atom percent, and b and c are at least 25 atom percent.

4,496,636

PROCESS FOR DEPOSITING A COAT OF PAINT ON WOOD-CEMENT BOARDS

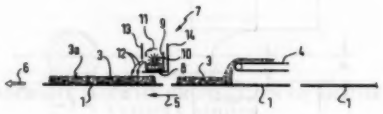
Günter Exner, Dettelbach, Fed. Rep. of Germany, assignor to Fulgurit GmbH & Co. Kommanditgesellschaft, Wunstorf, Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,135

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133974

Int. Cl.[3] **D04H** *1/16;* **B05D** *1/00*

U.S. Cl. 428—703 **15 Claims**



1. In a process for depositing a coat of paint on wood-cement boards manufactured by pouring a strewable mixture of fibers and binder onto press plates followed by pressing the plates in a stack, the board surface after pressing having a base for applying said coat of paint upon which said coat of paint is applied, the improvement comprising:

depositing binder liquid on an upper layer of said strewable mixture of fibers and binder, said binder liquid being colored through with an inorganic dye, and in that the press plate together with the layers so deposited is fed to a press for said pressing, said base for applying said coat of paint comprising said binder liquid colored through with said inorganic dye.

13. The product produced by the process of claim **1**.

4,496,637

ELECTRODE FOR FLOWCELL

Masayoshi Shimada; Yasuhiro Iizuka, and Tetuo Hukazu, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1983, Ser. No. 564,744

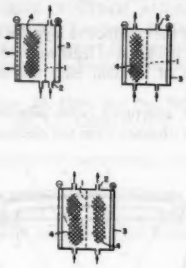
Claims priority, application Japan, Dec. 27, 1982, 57/229994

Int. Cl.[3] **H01M** *4/96*

U.S. Cl. 429—44 **8 Claims**

1. An electrode for a flowcell which comprises an electrode material made of carbon fiber having <002> spacing of quasi-

graphite crystalline structure of not more than 3.70 Å, and an average C-axis size of crystallite of not less than 9.0 Å and at



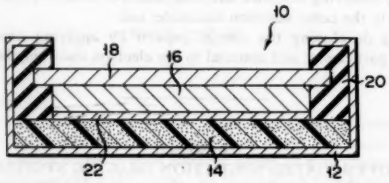
least 3% by mole of oxygen atom bound to the fiber surface based on carbon atom.

4,496,638

SOLID-ELECTROLYTE CELL

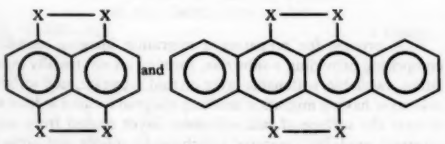
Masami Sugiuchi, and Atsuo Imai, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 30, 1983, Ser. No. 480,313
Claims priority, application Japan, Mar. 30, 1982, 57-50196
Int. Cl.³ H01M 6/18
U.S. Cl. 429—192 **8 Claims**



1. A solid-electrolyte cell comprising:

a cathodic active material layer comprising a polymeric compound and a charge-transfer complex dispersed therein, the charge-transfer complex containing iodine as an electron acceptor and, as an electron donor, a compound selected from the group consisting of naphthalene and tetracene derivatives respectively represented by general formulas:



(wherein each X is sulfur, selenium or tellurium);

an anodic active material layer which comprises a light metal and which is formed in contact with the anodic active material layer; and

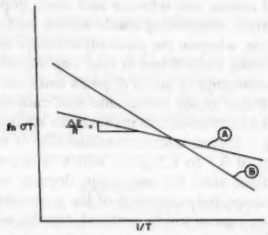
a solid-electrolyte layer which is formed in situ at an interface between the anodic and cathodic active material layers by a reaction between the iodine in the charge-transfer complex and the light metal.

4,496,639

HYDROGEN SELENIDE TREATMENT OF ELECTROLYTES

James R. Rasmussen, and Anil V. Virkar, both of Salt Lake City, Utah, assignors to Ceramatec, Inc., Salt Lake City, Utah

Filed Jul. 5, 1983, Ser. No. 510,818
Int. Cl.³ H01M 6/18
U.S. Cl. 429—193 **7 Claims**



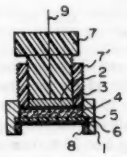
1. A method of adding selenium to a polycrystalline ceramic electrolyte comprising contacting said electrolyte with gaseous hydrogen selenide for a period sufficient to cause uptake of said hydrogen selenide by said electrolyte.

4,496,640

BATTERY HAVING ACETYLENE HIGH POLYMER ELECTRODE

Yukio Kobayashi, Tokyo; Masaaki Kira, Yokohama, and Kinya Yamaguchi, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 339,867, Jan. 18, 1982, abandoned. This application Sep. 12, 1983, Ser. No. 531,577
Claims priority, application Japan, Jan. 22, 1981, 56-7162; Sep. 1, 1981, 56-136073; Sep. 2, 1981, 56-137088; Sep. 2, 1981, 56-137090; Sep. 8, 1981, 56-140284; Sep. 28, 1981, 56-151951
Int. Cl.³ H01M 4/60
U.S. Cl. 429—213 **16 Claims**

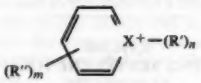


1. A battery comprising anode means, cathode means and an electrolyte, wherein the electrolyte comprises a compound capable of being ionized into at least one dopant selected from the group consisting of anion dopants and cation dopants and at least one of said anode means and said cathode means comprises, as its electrode-active material, an acetylene high polymer shaped article having a fibrous microcrystalline structure and a bulk density of 0.7 to 1.2 g/cc, which is prepared by shaping under pressure an acetylene high polymer swollen with an inert organic solvent and which is dopable to a more highly oxidized state by said anion dopant, or an electron-accepting compound consisting of the molecule of said anion or dopable to a more lowly oxidized state by said cation dopant, or an electron-donating compound consisting of the molecule of said cation.

13. A battery comprising anode means, cathode means and an electrolyte, wherein the electrolyte comprises a compound capable of being ionized into at least one dopant selected from the group consisting of anion dopants and cation dopants and

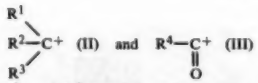
at least one of said anode means and said cathode means comprises, as its electrode-active material, an acetylene high polymer having a fibrous microcrystalline (fibril) structure and a bulk density of 0.7 to 1.2 g/cc, which is dopable to a more highly oxidized state by said anion dopant, or an electron-accepting compound consisting of the molecule of said anion or dopable to a more lowly oxidized state by said cation dopant, or an electron-donating compound consisting of the molecule of said cation, and wherein said anion dopant is HF_2^-.

16. A battery comprising anode means, cathode means and an electrolyte, wherein the electrolyte comprises a compound capable of being ionized into at least one dopant selected from the group consisting of anion dopants and cation dopants and least one of said anode means and said cathode means comprises, as its electrode-active material, an acetylene high polymer having a fibrous microcrystalline (fibril) structure and a bulk density of 0.7 to 1.2 g/cc, which is dopable to a more highly oxidized state by said anion dopant, or an electron-accepting compound consisting of the molecule of said anion or dopable to a more lowly oxidized state by said cation dopant, or an electron-donating compound consisting of the molecule of said cation, and wherein said cation dopant is selected from the group consisting of pyrylium and pyridinium cations represented by the following formula (I):



(I)

wherein X stands for an oxygen atom or nitrogen atom, R' stands for a hydrogen atom, an alkyl group having 1 to 20 carbon atoms or an aryl group having 6 to 20 carbon atoms, R'' stands for a halogen atom, an alkyl group having 1 to 10 carbon atoms or an aryl group having 6 to 20 carbon atoms, n is zero when X is an oxygen atom or n is 1 when X is a nitrogen atom, and m is an integer of from 0 to 5; and carbonium cations represented by the following formula (II) and (III):



wherein R^1, R^2, and R^3 stand for a hydrogen atom, an alkyl group having 1 to 15 carbon atoms, an allyl group, an aryl group having 6 to 20 carbon atoms or a group —OR^5, in which R^5 stands for an alkyl group having 1 to 10 carbon atoms or an aryl group having 6 to 20 carbon atoms, with the proviso that the case where all of R^1, R^2 and R^3 are hydrogen atoms is excluded, and R^4 stands for a hydrogen atom, an alkyl group having 1 to 15 carbon atoms or an aryl group having 6 to 20 carbon atoms.

4,496,641

METHOD OF MANUFACTURING A COLOUR TELEVISION DISPLAY TUBE AND TUBE MANUFACTURED ACCORDING TO THIS METHOD

Jacob Van Den Berg; Johannes G. Van Lent, and Francis B. Strik, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 174,418, Aug. 1, 1980, abandoned, which is a continuation of Ser. No. 949,603, Oct. 10, 1978, abandoned, which is a continuation of Ser. No. 736,176, Oct. 27, 1976, abandoned. This application Jan. 18, 1983, Ser. No. 459,016

Claims priority, application Netherlands, Oct. 27, 1975, 7512513

Int. Cl.³ G03G *13/048*

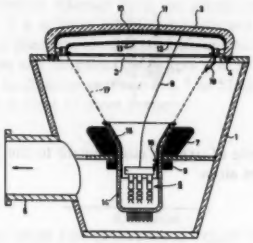
U.S. Cl. 430—23 **10 Claims**

1. A method of providing a predetermined pattern of a material on a color television display tube window, including the steps of:

(a) depositing a conductive layer on an inner surface of the window;

(b) depositing on the conductive layer an electron absorbing layer having a thickness at least equal to the average depth of penetration of incident electrons having a predetermined energy;

(c) mounting an apertured color selection electrode at a predetermined distance from the electron absorbing layer;



(d) producing a beam of electrons having said energy and emanating from an electron gun mounted at a predetermined position relative to the color selection electrode;

(e) exposing the electron absorbing layer by scanning the electron beam across the color selection electrode and passing it through the apertures in said electrode to directly form a negative charge pattern on said electron absorbing layer;

(f) removing the color selection electrode from its proximity to the color selection electrode; and

(g) developing the charge pattern by applying charged particles of said material to the electron absorbing layer.

4,496,642

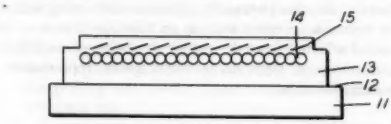
OVERCOATED MIGRATION IMAGING SYSTEM

Man C. Tam, and Gregory J. Kovacs, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 12, 1983, Ser. No. 493,914

Int. Cl.³ G03G *5/00, 5/14*

U.S. Cl. 430—41 **9 Claims**



1. A process for preparing a migration imaging member comprising providing a substrate, forming an electrically insulating, swellable, softenable layer on said substrate, said softenable layer having migration marking material located at least at or near the surface of said softenable layer spaced from said substrate, applying a material which swells at least said surface of said softenable layer, and applying a protective overcoating forming mixture comprising a film forming resin to said softenable layer, said softenable layer being sufficiently swollen by said material which swells said surface of said softenable layer to allow part of said film forming resin to penetrate said softenable layer to a depth of at least about 20 Angstroms to form a boundary zone comprising material from said softenable layer and said film forming resin while said softenable layer is swollen.

4,496,643
TWO-COMPONENT DRY ELECTROSTATIC DEVELOPER COMPOSITION CONTAINING ONIUM CHARGE CONTROL AGENT

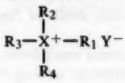
John C. Wilson, Rochester; Lawrence P. DeMejo, Pittsford; Thomas A. Jadwin, and Stewart H. Merrill, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,996
Int. Cl.³ G03G *9/10*
U.S. Cl. 430—110 **9 Claims**

1. A dry, two-component electrostatic developer composition comprising:

(a) toner particles comprising a polymeric binder,

(b) an onium compound, as a charge-control agent, dispersed in the toner binder and having the formula:

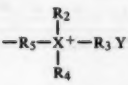


wherein:

X is a phosphorous, arsenic or antimony atom;

each of R_2, R_3 and R_4, which are the same or different, represents alkyl having from 1 to about 20 carbon atoms; aralkyl or alkaryl in which the alkyl group has 1 to about 20 carbon atoms and the aryl group has from about 6 to about 14 carbon atoms; or aryl having from about 6 to about 14 carbon atoms;

R_1 represents a group as defined with respect to R_2, R_3 and R_4; a hetero ring system when taken together with X and any one of R_2, R_3 and R_4; or the group:



wherein:

R_5 is alkylene having from about 1 to about 20 carbon atoms; oxydialkylene having from about 1 to about 20 carbon atoms in each alkylene group or dialkylenearylene having from about 1 to about 20 carbon atoms in each alkylene group and from about 6 to about 14 atoms in the arylene group; and

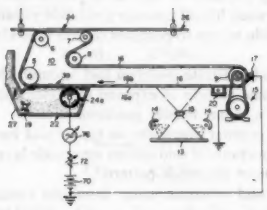
Y^- is an anion, and

(c) carrier particles surface-coated with a fluoropolymer.

4,496,644
ELECTRIC FIELD ADJUSTMENT FOR MAGNETIC BRUSHES

Antoun I. Ateya, and Wei C. Lu, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,124
Int. Cl.³ G03G *13/09, 15/09*
U.S. Cl. 430—122 **4 Claims**



1. A method of reducing flaming and background development of an electrostatic image carried on a surface of a member comprising the steps of:

contacting the surface with a developer comprising a magnetic carrier and toner particles that have been triboelectrically charged,

applying a steady state electrical bias between the developer material and the member with the steady state bias being selected to minimize background development on the member,

applying an A.C. voltage signal between the developer material and the member,

adjusting the frequency of the A.C. signal to minimize flaming of images developed on such member, and

adjusting the peak-to-peak voltage of the A.C. signal until it is at a level which fully develops solid image areas on the member without mottle.

4,496,645
PROCESS FOR THE PRODUCTION OF A PHOTOGRAPHIC COLOR IMAGE BY IMAGE-WISE DYE DIFFUSION TRANSFER

Wilhelmus Janssens, Aarschot, and Daniël A. Claeys, Mortsel, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Oct. 26, 1983, Ser. No. 545,433
Claims priority, application United Kingdom, Nov. 12, 1982, 8232450
Int. Cl.³ G03C *5/54, 1/40, 7/20*
U.S. Cl. 430—239 **10 Claims**

1. A photographic colour diffusion transfer process comprising the steps:

(1) image-wise photo-exposing a photographic material which contains on a support at least one waterpermeable silver halide emulsion layer, the silver halide of which essentially consists of silver chloride, and in operative contact therewith at least one non-diffusing ballasted dye or dye precursor which when contacted with an aqueous alkaline liquid remains immobile in a waterpermeable colloid layer, and which when reacted with a reducing compound in the presence of an aqueous alkaline liquid sets free the diffusible dye or dye precursor,

(2) treating the photographic material with an alkaline processing liquid in the presence of a silver halide developing agent to effect development of the exposed silver halide emulsion layer, thereby image-wise oxidizing the developing agent and as an inverse function of image-wise silver halide development reducing said non-diffusing ballasted compound,

(3) maintaining said photographic material in contact with the alkaline processing liquid in the presence of said developing agent for a time sufficient to release said dye or dye precursor in diffusible state from the reduced ballasted compound(s); and

(4) transferring at least a portion of said released dye or dye precursor to a non-light-sensitive layer acting as a receptor layer to form a dye image thereon,

characterised in that the development proceeds in the presence of free iodide ions.

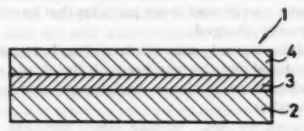
4,496,646
PHOTOSENSITIVE IMAGING MATERIAL

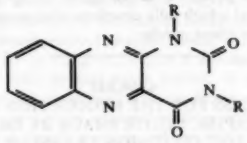
Kengo Ito, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00107, § 371 Date Nov. 29, 1983, § 102(e) Date Nov. 29, 1983, PCT Pub. No. WO83/03687, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 7, 1983, Ser. No. 557,167
Claims priority, application Japan, Apr. 7, 1982, 57-57654; Sep. 24, 1982, 57-167125
Int. Cl.³ G03C *1/68, 5/00, 5/24;* G08F *2/50*
U.S. Cl. 430—271 **23 Claims**

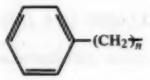
1. A photosensitive imaging material which comprises a

photosensitive composition containing an alloxazine derivative reprensated by the general formula:





[wherein R's may be the same or different from each other and each represents an alkyl group having 1 to 20 carbon atoms or a phenylalkyl group of the general formula:



(wherein n represents an integer of 1 or more)] as a photopolymerization initiator, a binder and a polymerizable tackifying monomer.

4,496,647

TREATMENT OF IMAGE-FORMING LAMINATED PLATE

Norio Kawabe, Ohtsu; Mikio Tsuda, Ohmihachiman, and Sadao Kobashi, Yohkaichi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,963
Claims priority, application Japan, Jul. 21, 1982, 57-125757
Int. Cl.³ G03C *7/02*
U.S. Cl. 430—303 **14 Claims**

1. A process for treating a dry planographic printing unprocessed plate comprising a base substrate, a photosensitive layer containing a quinonediazide and a silicone rubber layer in laminating order, characterized in that the dry planographic printing unprocessed plate is subjected to a treatment with a base after imagewise exposure but before or at the same time of development said base being present in an amount sufficient to enhance both the adhesion of the photosensitive layer to the silicone rubber layer and the solvent resistance of the photosensitive layer in non-image areas.

4,496,648

METHOD OF MAKING HIGH RELIABILITY LEAD-ALLOY JOSEPHSON JUNCTION

Peter L. Young, North Wales, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,568
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.³ H01L *39/22, 39/24*
U.S. Cl. 430—312 **16 Claims**

1. A method of producing lead-gold base electrodes for superconducting Josephson junction devices having very high tolerance to thermal cycling, comprising:

providing a substrate wafer,

providing a photoresist mask on said substrate wafer,

placing said substrate wafer in a vacuum chamber,

producing a high vacuum in said chamber to at least 1×10^{-6} torr,

metering a predetermined amount of inert gas into said vacuum chamber to provide a pressure of approximately $(5 \text{ to } 30)\times10^{-3}$ torr in said high vacuum,

locating the surface of said substrate wafer approximately normal to the line of sight of metals to be evaporated and deposited thereon,

evaporating at least three layers on said substrate in said inert gas while maintaining said inert gas pressure in said chamber,

said layers comprising at least one layer of gold and one layer of lead, and a third layer of superconducting metal,

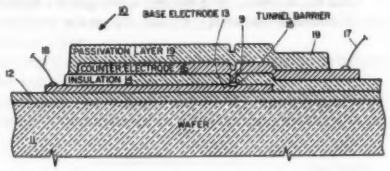
annealing said wafer at an elevated temperature to cause interdiffusion of said gold, lead and superconducting metal layers into one layer of fine-grain base electrode material,

removing said photoresist mask from said substrate wafer to provide a base electrode having very high tolerance to thermal cycling.

13. A method as set forth in claim 1 which further includes the additional steps of:

applying a second photoresist layer on top of said base electrode material,

baking the photoresist layer at temperatures in excess of seventy-five degrees centigrade,



exposing said photoresist layer to a pattern of ultra violet light applied through a mask,

developing portions of said exposed photoresist layer to provide a raised lift-off junction photoresist pattern thereon,

placing said substrate wafer in said vacuum chamber,

depositing a layer of silicon monoxide on said base electrode and said photoresist lift-off pattern,

removing said substrate wafer from said vacuum chamber,

removing said photoresist lift-off junction photoresist pattern,

applying a third photoresist layer,

exposing said third photoresist layer to a pattern of ultra violet light,

developing portions of said third photoresist layer to provide a raised lift-off counter electrode photoresist pattern to provide access to portions of said base electrode material,

placing said substrate wafer in said vacuum chamber,

oxidizing said pattern of exposed base electrode material to provide a tunnel barrier junction,

forming a counter electrode on top of said barrier junction and on portions of said silicon monoxide layer exposed by said counter electrode pattern,

removing said substrate wafer from said vacuum chamber, and

removing said counter electrode lift-off pattern to provide a Josephson junction device.

4,496,649

COLOR-PHOTOGRAPHIC RECORDING MATERIAL

David G. Leppard, Marly, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

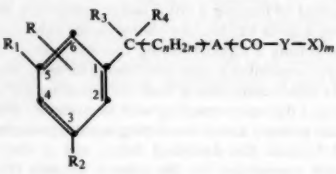
Filed Dec. 15, 1983, Ser. No. 562,189

Claims priority, application Switzerland, Dec. 16, 1982, 7315/82

Int. Cl.[3] G03C 7/40, 7/26

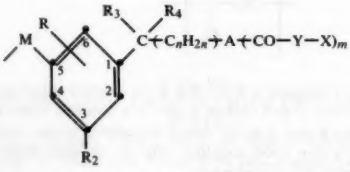
U.S. Cl. 430—372 24 Claims

1. A colour-photographic recording material which, in at least one light-sensitive silver halide emulsion layer, an interlayer and/or a protective layer, contains a light-stabilizing amount of at least one polyalkylpiperidine compound as a stabiliser, wherein the polyalkylpiperidine compound is of the formula I



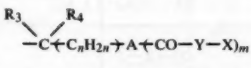
(I)

in which R is an OH group in the 2-position, 4-position or 6-position, R_1 is hydrogen, C_1–C_4-alkyl, a group of the formula II



(II)

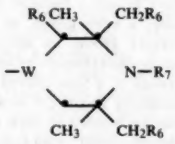
or a group of the formula III



(III)

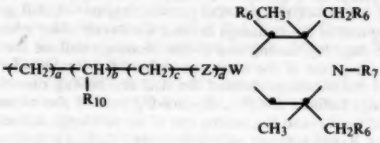
R_2 is C_1–C_4-alkyl, a group of the formula III or a group of the formula —CO—Y—X, R_3 and R_4 independently of one another are C_1–C_8-alkyl and, in addition, R_4 can, together with the group $-(C_nH_{2n})-$, form a C_5–C_{12}-cycloalkyl radical, n is a number from 1 to 20, m is 1 or 2, A is a direct C—C bond if m=1 or a radical

if m=2, Y is —O— or —N(R_5)—, wherein R_5 is hydrogen, C_1–C_{18}-alkyl, C_3–C_{12}-alkenyl, C_3–C_{12}-cycloalkyl, phenyl, C_7–C_{14}-aralkyl, C_7–C_{14}-alkaryl, C_2–C_{11}-alkoxyalkyl or a group of the formula IV

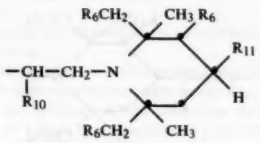


(IV)

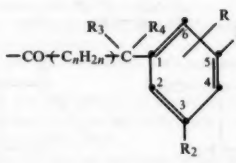
M is a direct bond, —O—, —S—, —S—S—, —SO—, —SO_2— or a group —CH_2OCH_2—, —CH_2SCH_2—, —CH(R_8)— or —N(R_9)—, wherein R_8 is hydrogen, C_1–C_{12}-alkyl or C_3–C_8-alkyl or C_3–C_8-alkyl interrupted by 1–3 sulfur atoms, and R_9 is hydrogen, C_1–C_{18} -alkyl or unsubstituted or C_1–C_4-alkyl-substituted phenyl or benzyl, X is a group of the formula



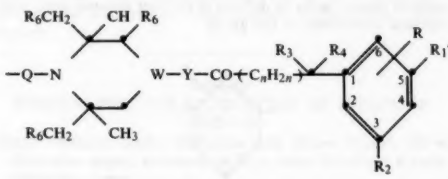
or of the formula



a is one of the numbers from 0 to 10, b, c and d independently of one another are the number 0 or 1, it being necessary for the sum a+b+c≠0 if d=1, R_6 is hydrogen or methyl, R_7 is hydroxyl, C_1–C_{12}-alkyl, C_3–C_6-alkenylmethyl, C_3–C_4-alkynylmethyl, C_7–C_{14} -aralkyl, glycidyl, C_1–C_4-alkyl substituted by halogen, cyano, —$COOR_{12}$ or —$CON(R_{13})$—(R_{14}), a group —COR_{15}, —$COOR_{12}$, —$CON(R_{13})$ (R_{14}), —CH_2—CH(R_1-6)—OR_{17}, —SOR_{18}, —SO_2R_{18}, —OR_{12} or —$OCOR_{15}$, R_{12} being C_1–C_{12}-alkyl, alkyl, cyclohexyl or benzyl, R_{13} being C_1–C_{12}-alkyl, alkyl, cyclohexyl, benzyl, phenyl or C_7–C_{10}-alkylphenyl, R_{14} being hydrogen, C_1–C_{12}-alkyl, allyl, cyclohexyl or benzyl, or R_{13} and R_{14}, together with the N atom to which they are attached, forming a 5-membered or 6-membered heterocyclic ring, R_{15} being hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl, chloromethyl, C_5–C_8-alkyl, C_7–C_{14}-aralkyl, phenyl, C_7–C_{10}-alkylphenyl or phenyl, phenylmethyl or phenylethyl which are substituted by 1 or 2 C_1–C_4-alkyls and 1 hydroxyl, R_{16} being hydrogen, C_1–C_4-alkyl, C_3–C_4-alkoxyalkyl, phenyl or phenoxymethyl, R_{17} being hydrogen, C_1–C_{12}-alkyl, a group —COR_{15} or —$CON(R_{13})$ (R_{14}) or a group of the formula

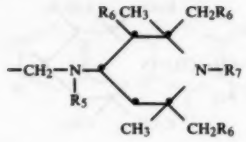


in which R_1 is hydrogen or C_1–C_4-alkyl, and R_{18} being C_1–C_{12}-alkyl, phenyl or C_7–C_{10}-alkylphenyl, or R_7 is a group of the formula

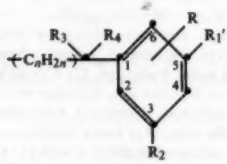


in which Q is a group —(C_rH_{2r})— wherein r is one of the numbers 2 to 12, or Q is C_4–C_8-alkylenylene, C_5–C_{12}-cycloalkylene, phenylene, xylylene, bitolylene or a group

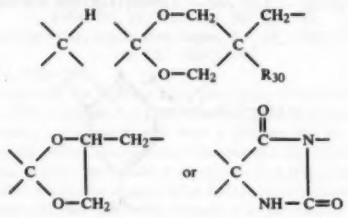
—CO—(C_rH_{2r})—CO—, Z is —O— or —N(R_{19})— wherein R_{19} is hydrogen, C_1–C_{18}-alkyl, C_3–C_{12}-alkenyl, C_3–C_{12}-cycloalkyl, phenyl, C_7–C_{14}-alkaryl, C_7–C_{14}-aralkyl, C_2–C_{11}-alkoxyalkyl or a group —COR_{20}, —$COOR_{21}$, —$CON(R_{22})(R_{23})$, —CH_2—$CH(R_{24})$—OR_{25}, —SOR_{26} or —SO_2R_{26}, R_{20} having one of the meanings defined for R_{15} or being a heterocyclic ring, R_{21} having one of the meanings defined for R_{12}, R_{22} having one of the meanings defined for R_{13}, R_{23} having one of the meanings defined for R_{14}, R_{24} having one of the meanings defined for R_{16}, R_{25} having one of the meanings defined for R_{17} and R_{26} having one of the meanings defined for R_{18}, or R_{19} is a group of the formula IV, R_{10} is hydrogen, C_1–C_{18}-alkyl, C_7–C_{23}-phenoxyalkyl, phenyl, C_7–C_{14}-aralkyl, C_2–C_{11}-alkoxyalkyl or a group



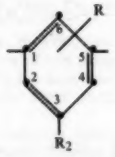
R_{11} is hydrogen, —OR_{27}, —$OCOR_{28}$, —N(R_{29})—COR_{28}, —OSO_2R_{28} and —N(R_{29})—SO_2R_{28}, R_{27} being hydrogen, C_1–C_{12}-alkyl, allyl or benzyl, R_{28} being hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl, chloromethyl, C_5–C_8-cycloalkyl, C_7–C_9-phenylalkyl, C_7–C_{10}-alkylphenyl, phenyl or a group of the formula



and R_{29} being hydrogen, C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl or benzyl, and W being one of the groups



in which R_{30} is methyl or ethyl, with the proviso that, if W is a cyclic ketal structure, d is 0 and the sum a+b+c must also be 0 and, if W is a hydantoin structure, d must be 0 and the sum a+b+c must be ≠0, the repeatedly mentioned radicals and symbols always being as defined in the first instance and, with repeated occurrence of the group



R always being in the same position.

24. A process for the production of photographic colour images by imagewise exposure and colour development of a colour-photographic recording material according to claim **1**.

4,496,650

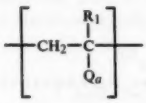
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Morio Yagihara; Tsumoru Hirano, and Makoto Umemoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 17, 1984, Ser. No. 571,628
Claims priority, application Japan, Jan. 17, 1983, 58-5446
Int. Cl.³ G03C *7/16, 7/26*
U.S. Cl. 430—381 **25 Claims**

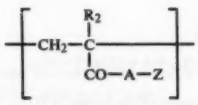
25. A method of forming a color image comprising imagewise exposing a silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing a cyan color image forming polymer coupler latex which comprises at least one repeating unit capable of forming a dye upon coupling with an oxidation product of an aromatic primary amine developing agent represented by the general formula (II) described below and at least one repeating unit represented by the general formula (II) described below:

(Ia)

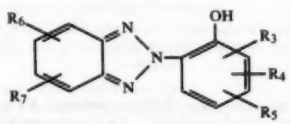


wherein R_1 represents a hydrogen atom, a lower alkyl group containing from 1 to 4 carbon atoms or a chlorine atom; and Q_a represents a cyan coupler moiety-containing group capable of forming a dye upon coupling with an oxidized aromatic primary amine developing agent,

(II)



wherein R_2 represents a hydrogen atom, a lower alkyl group containing from 1 to 4 carbon atoms or a chlorine atom; A represents —O— or —NH—; and Z represents



wherein R_3, R_4, R_5, R_6 and R_7, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkenyl group, an alkoxy group, a halogen atom, a carboxy group, a hydroxy group, a nitro group, an aryl group, an acyloxy group, an aryloxy group, an alkylthio group, an arylthio group, a mono- or dialkylamino group, an acylamino group, a sulfonamido group or a 5-membered or 6-membered heterocyclic group containing an oxygen atom or a nitrogen atom, or R_6 and R_7 may be bonded to each other to form a 5-membered or 6-membered aromatic ring consisting of carbon atoms; and A may be bonded to any of the phenol ring and the benzotriazole ring of Z, developing the exposed material using an alkaline aqueous solution containing an aromatic primary amine developing agent.

4,496,651

COLOR TRANSFER PHOTOGRAPHIC PROCESSES AND PRODUCTS

Leon D. Cerankowski, Carlisle; Gary S. LaPointe, Beverly, and Neil C. Mattucci, Billerica, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 516,597, Jul. 25, 1983, Pat. No. 4,456,674, which is a continuation-in-part of Ser. No. 437,896, Nov. 1, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,626

Int. Cl.[3] G03C *5/54, 5/30*

U.S. Cl. 430—490 9 Claims

1. A rupturable container for use in diffusion transfer film units adapted to provide transfer images viewable by reflected light, said rupturable container releasably holding an aqueous alkaline processing composition comprising an aqueous solution of alkali metal hydroxide; a viscosity-imparting reagent; a light-reflecting pigment; colloidal silica; a metal chelating agent; and an alkali soluble calcium salt in an amount sufficient to stabilize the spreading characteristics of said processing composition.

4,496,652

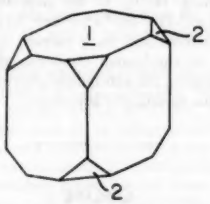
SILVER HALIDE CRYSTALS WITH TWO SURFACE TYPES

Eugene F. Haugh; Earle L. Kitts, Jr., both of Wilmington, and Daniel J. Mickewich, Arden, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 972,972, Dec. 26, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,798

Int. Cl.[3] G03C *1/28, 1/02*

U.S. Cl. 430—569 3 Claims



1. In a process wherein silver iodobromide crystals are formed by precipitation under balanced double jet conditions, and subsequently the crystals are either sensitized with sulfur and gold sensitizers and used to form a high speed negative emulsion or the crystals are fogged and then used to produce a high speed direct positive, the improvement comprising precipitating the silver iodobromide crystals at a pAg of between about 8 and 9 and a temperature of 35°–50° C., with high agitation, to produce tetradecahedral crystals, followed by contacting said crystals with a solution of silver nitrate and a solution of ammonium or alkali metal chloride, bromide, or a mixture of both, at a temperature of 35°–50° C. and a pAg of 6 to 8, using high agitation, whereby silver bromide or silver chlorobromide is caused to deposit preferentially on the (111) surfaces of said tetradecahedral crystals, the molar ratio of the tetradecahedral body to the resulting corners being from 60-40 to 97-3.

4,496,653

PROCESS FOR THE DETERMINATION OF ANTITHROMBIN-BM

Helmut Lill, Wielenbach; Jürgen Schrenk, Weilheim, and Peter Wunderwald, Haunshofen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

PCT No. PCT/DE81/00170, § 371 Date Jun. 9, 1982, § 102(e) Date Jun. 9, 1982, PCT Pub. No. WO82/01377, PCT Pub. Date Apr. 29, 1982

PCT Filed Oct. 8, 1981, Ser. No. 394,998

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038163; Aug. 4, 1981, 3050268

Int. Cl.[3] C12Q *1/56, 1/38*

U.S. Cl. 435—7 10 Claims

1. A process for the determination of antithrombin-BM in a sample comprising

adding, to the sample, an antithrombin-BM cofactor, thrombin and a determinable thrombin substrate;

measuring the splitting of the thrombin substrate in the presence of a high concentration of cofactors, and in the presence of a low concentration of cofactors, the cofactors being selected from the group consisting of heparin, xylan and λ-carrageenan; and

determining the antithrombin-BM activity from the difference between the measurement at high and at low cofactor concentration.

4,496,654

DETECTION OF HCG WITH SOLID PHASE SUPPORT HAVING AVIDIN COATING

David H. Katz, La Jolla; Steven W. Cooper; Theodore T. Lee, both of San Diego, and Shung-Ho Chang, Encinitas, all of Calif., assignors to Quidel, La Jolla, Calif.

Filed Apr. 8, 1983, Ser. No. 483,231

Int. Cl.[3] G01N *33/54*

U.S. Cl. 435—7 16 Claims

1. In the method for determining human chorionic gonadotropin (HCG) which comprises reacting a solution suspected of containing HCG with labeled anti-HCG antibody and determining the presence of HCG bound antibody, the improvement comprising:

(a) coating a solid phase support with avidin to provide on the surface thereof binding sites for biotin;

(b) biotinylating anti-HCG antibody;

(c) reacting the biotinylated anti-HCG antibody with the avidin coated support;

(d) labeling anti-HCG antibody with indicator moiety which can be detected;

(e) reacting the biotinylated antibody of step (c) and the labeled antibody of step (d) with a test solution suspected of containing HCG; and

(f) measuring the labeled antibody bound through HCG to the support to show the presence or absence of human chorianic gonadotropin in the test solution.

11. As an article of manufacture, a solid phase support having a surface, an avidin coating on at least substantial portions of said surface, and biotinylated antibody or biotinylated antigen printed in a predetermined pattern on the avidin coated surface.

4,496,655

PROCESS FOR THE PRODUCTION OF TYRAMINE OXIDASE

Eiichi Yoshino; Kazuo Matsuura, and Hideo Misaki, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 28, 1982, Ser. No. 454,060

Claims priority, application Japan, Dec. 28, 1981, 56-209676

Int. Cl.[3] C12N *9/06;* C12Q *1/36, 1/26;* C12R *1/06*

U.S. Cl. 435—191 3 Claims

1. A process for the production of tyramine oxidase, which

comprises culturing Arthrobacter sp. B-0813 FERM-P No. 6240 in a nutrient medium, and isolating thus-produced tyramine oxidase from the cultured medium.

4,496,656

PROCESS FOR PRODUCTION OF CELLULASE

Katsumi Nakamura, Takasaki, and Kumpei Kitamura, Yoshioka, both of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,131

Claims priority, application Japan, Nov. 10, 1981, 56-180133

Int. Cl.³ C12N *9/42, 1/20;* C12R *1/01*

U.S. Cl. 435—209 **6 Claims**

1. A process for producing a cellulase, which comprises culturing a cellulase-producing microorganism belonging to *Cellulomonas uda* CB4 in a cellulose-containing medium and recovering the cellulase produced.

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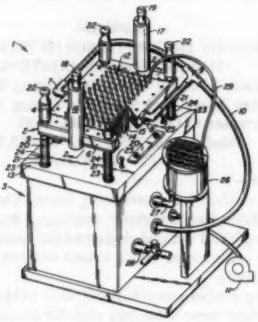
MICROPLATE WASHER

Ward J. Coppersmith, San Diego, and George B. LaMotte, III, Larkspur, both of Calif., assignors to Scripps Clinic and Research Foundation, Calif.

Filed Oct. 14, 1982, Ser. No. 434,308

Int. Cl.³ C12M *1/00, 1/32;* B01L *3/00*

U.S. Cl. 435—287 **10 Claims**



1. An apparatus for the alternate filling and evacuation of all wells simultaneously of a multiwell microplate, said apparatus comprising:

a vacuum chamber defined by two parallel plates designated an upper plate and a lower plate, respectively, said plates separated by peripheral spacing means, said lower plate having affixed therein a plurality of tubes spaced apart from each other, each said tube passing through said lower plate and perpendicular thereto, said tubes forming a rectangular array such that, when said chamber is superimposed over said microplate, a pair of said tubes is aligned with each well of said microplate, the portions of each tube of said pair which extend below said lower plate being of unequal length, the tube with the shorter portion below the lower plate being designated a filling tube and the tube with the longer portion below the lower plate being designated an evacuation tube, said filling tube extending upward through said chamber and said upper plate, and said evacuation tube terminating within said chamber above the lower plate,

a support for said microplate, said support comprising a substantially flat horizontal surface containing guide means adapted to secure said microplate in a predetermined position on said support surface,

means for maintaining said vacuum chamber in vertical alignment with said support with said upper and lower plates of said vacuum chamber and said support surface in parallel relation, and for narrowing and widening the distance between said vacuum chamber and said support surface while substantially maintaining said parallel relation,

stop means for setting a minimum spacing distance between said vacuum chamber and said support surface such that when said distance is at said minimum, the exposed end of each said evacuation tube is sufficiently close to the bottom of the corresponding well in said microplate to permit evacuation of substantially all liquid from said well,

means for applying a vacuum to said vacuum chamber, and

means for supplying pressurized fluid to each said filling tube at the upper end thereof.

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METHOD FOR ENZYME IMMUNOASSAY AND PRODUCTION OF ANTIBODY

Koichi Kondo, Osaka; Susumu Iwasa, Tsuzuki, and Isamu Yoshida, Hirakata, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 14, 1981, Ser. No. 311,327

Claims priority, application Japan, Oct. 15, 1980, 55-144689; Jan. 14, 1981, 56-4507

Int. Cl.³ G01N *33/54, 33/56, 33/58*

U.S. Cl. 436—510 **8 Claims**

1. In a method for immunochemical assay of human chorionic gonadotropin using an antibody immobilized on a carrier, an antigen and an antibody coupled with a labeling agent, the improvement which comprises using as the antibody to be immobilized on the carrier and the antibody to be coupled with the labeling agent different antibodies which are not overlapping in antigen-determining site, and wherein one of said different antibodies is specifically reactive to human chorionic gonadotropin,

said specifically reactive antibody being obtained by contacting a peptide of the formula:

H-R-Pro-Ser-Asp-Thr-Pro-Ile-Leu-Pro-Gln-OH

wherein R is a partial peptide of 1 to 14 amino acid residues including 14-Gly of the peptide Ala^{1}-Pro^{2}-Pro^{3}-Pro^{4}-Ser^{5}-Leu^{6}-Pro^{7}-Ser^{8}-Pro^{9}-Ser^{10}-Arg^{11}-Leu^{12}-Pro^{13}-Gly^{14}, as immobilized on a carrier, with a body fluid containing an anti-human chorionic gonadotropin antibody, and eluting the anti-human chorionic gonadotropin antibody thus specifically absorbed.

4,496,659

SULFUR CEMENT-AGGREGATE COMPOSITIONS AND METHODS FOR PREPARING

Edward L. Nimer, San Rafael, and Robert W. Campbell, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 414,716, Sep. 3, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,327

Int. Cl.³ C04B *19/06*

U.S. Cl. 501—140 **17 Claims**

1. A sulfur cement and aggregate composition which comprises a sulfur cement, an aggregate, contaminated with up to 5% by weight of an expansive clay, and an amount of a carboxylic acid, selected from the group of acetic acid, dicarboxylic acids, and mixtures thereof, effective to substantially reduce the water expandability of said expansive clay and wherein said carboxylic acid has a boiling point above about 110° C. and is dispersed throughout said aggregate, with the proviso that said composition does not contain styrene or an alkene mercaptan.

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CATALYST PREPARED FROM ORGANO-MAGNESIUM COMPOUND; OXYGEN- OR NITROGEN-CONTAINING COMPOUND; HALIDE SOURCE; TRANSITION METAL COMPOUND AND REDUCING AGENT

Donald E. Gessell, Baton Rouge, La.; Ronald L. Gibbs, Midland, Mich., and Ricardo Fuentes, Jr., Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 1, 1980, Ser. No. 192,959
Int. Cl.³ C08F 4/02
U.S. Cl. 502—111 **29 Claims**

21. A process for preparing a hydrocarbon insoluble catalyst, which process comprises:

(I) reacting in an inert diluent

(A) the reaction product of

(1) an organomagnesium component or a mixture or complex thereof represented by the formula $MgR^2.xMeR'_{x'}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms, each R′ is independently hydrogen, a hydrocarbyl or a hydrocarbyloxy group having from 1 to about 20 carbon atoms, Me is Al, Zn or B, x has a value of from zero to about 10; and x′ has a value equal to the valence of Me; and

(2) (a) an oxygen-containing compound, nitrogen-containing compound or mixture of such compounds in a quantity sufficient to lower the amount of hydrocarbyl groups present in component (A-1) such that the resultant product does not substantially reduce $TiCl_4$ at a temperature of about 25° C.; and optionally

(2) (b) having disolved or dispersed in component (I-A-2-a) one or more transition metal compound(s) represented by the formula $Tm'Y_nX_{z-n}$ wherein Tm′ is a transition metal selected from groups I-B, IV-B, V-B, VI-B, VII-B or VIII of the Periodic Table of the Elements and is not the same element as that represented by Tm in component (II); Y is oxygen, OR″ or NR″$_2$; each R″ independently hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen atom; z has a value corresponding to the valence of the transistion metal Tm′; n has a value of from zero to 5; the value of z-n is from zero up to the valence of the transition metal Tm′; and wherein said transition metal compound, when present, is present in a quantity such that the Tm′:Tm, from component II, atomic ratio is from 0.01:1 to about 0.5:1; and

(B) a suitable halide source or mixture thereof represented by the formulas $AlR_{3-a}X_a$, $SiR_{4-b}X_b$, $SnR_{4-b}X_b$, POX_3, PX_3, PX_5, SO_2X_2, GeX_4, $R^4(CO)X$, TmY_nX_{z-n} and R^4X wherein each R is independently hydrogen, a hydrocarbyl or a hydrocarbyloxy group having from 1 to about 20 carbon atoms; R^4 is independently hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms; each X is a halogen atom; a has a value of from 1 to 3; b has a value of from 1 to 4; Tm is a metal selected from groups IV-B, V-B and VI-B of the Periodic Table of Elements; Y is oxygen, OR″ or NR″$_2$; each R″ is independently hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms; z has a value equal to the valence of said transition metal, n has a value of from zero to 5 with the value of z-n being from at least 1 up to a value equal to the valence of the transition metal; said halide source being present in a quantity sufficient to convert essentially all of the groups attached to a magnesium atom in component (A) to a halide group;

(II) recovering the resultant hydrocarbon insoluble product, washing said product with fresh inert diluent; and mixing the resultant washed product with fresh inert diluent; and

(III) combining the product from (II) with (C) a transition metal compound represented by the formula TmY_nX_{z-n} wherein Tm, Y, X, z and n are as defined as above; z-n has a value of from zero up to the valence of Tm; in a quantity so as to provide a Mg:Tm atomic ratio of from about 0.05:1 to about 50:1;

(IV) reacting the product from (III) with (D) a suitable reducing agent or mixture of reducing agents selected from compounds represented by the formulas $B(R^3)_{3-m}X_m$, $Al(R^3)_{3-m}X_m$, ZnR^3X, ZnR^3_2, MgR^3X or MgR^3_2 wherein each X is a halogen or a hydrocarbyloxy group having from 1 to about 20 carbon atoms or an NR^3_2 group; each R^3 is independently hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms; m has a value from zero to 2; said reducing agent being employed in a quantity so as to provide an R^3:Tm ratio of from about 1:1 to about 50:1; and

(V) recovering and washing with fresh inert diluent the resultant solid hydrocarbon insoluble catalyst produced in step IV; and

with the proviso that when said halide source, component (I-B), is a reducing aluminum halide and is employed in a quantity such that the R^3:Tm ratio is satisfied, then steps II and IV may be omitted.

4,496,661

HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Randall S. Shipley, Alvin, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1983, Ser. No. 545,311
Int. Cl.³ C08F 4/64
U.S. Cl. 502—115 **7 Claims**

1. In a catalytic reaction product of (A) a tetravalent titanium compound; (B) an organomagnesium component; and (C) a halide source, however if either component (B) or (C) does not contain sufficient quantities of aluminum, then (D) an organoaluminum compound is also present, said catalytic reaction product having atomic ratios of

Mg:Ti is from about 0.1:1 to about 500:1;

Al:Ti is from about 0.1:1 to about 500:1;

excess X:Al is from about 0.0001:1 to about 5:1;

the improvement which comprises employing as the tetravalent titanium compound, a mixture of at least one of (a) a tetrahydrocarbyloxytitanium compound or (b) a titanium tetrahalide with (c) a titaniumoxydihalide in a molar ratio of (a+b):(c) of from about 0.1:1 to about 10:1; and wherein excess X is the amount of excess halide above that which would be theoretically required to convert the magnesium compound to the dihalide.

4,496,662

CATALYSTS FOR PARA-ETHYLTOLUENE DEHYDROGENATION

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,471
Int. Cl.³ B01J 23/78, 23/86
U.S. Cl. 502—183 **4 Claims**

1. In a dehydrogenation catalyst composition consisting essentially of the following components:

(a) from about 30% to 60% by weight of iron oxide, calculated as ferric oxide;

(b) from about 13% to 48% by weight of potassium compound, calculated as potassium oxide; and

(c) from about 0% to 5% of chromium compound, calculated as chromic oxide,

the improvement consisting essentially of combining with said components (a), (b), and (c) a modifying component (d), said modifying component (d) being capable of enhancing the conversion of para-ethyltoluene when said modified catalyst is used to promote the preferential formation of para-methylstyrene from para-ethyltoluene, said modifying component (d) being a magnesium compound, said magnesium compound being present to the extent of from about 1% to 15% by weight of said catalyst composition, calculated as magnesium oxide.

4,496,663

PRODUCTION OF CATALYSTS

Charles B. Hanson, and Colin R. Harrison, both of Guisborough, England, assignors to Imperial Chemical Industries PLC, United Kingdom

Filed Jun. 20, 1983, Ser. No. 505,820
Claims priority, application United Kingdom, Jun. 29, 1982, 8218709
Int. Cl.³ B01J 27/14, 23/16, 21/00
U.S. Cl. 502—209 5 Claims

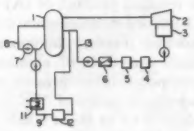
1. A process for producing a catalyst consisting essentially of a vanadium/phosphorus mixed oxide for the oxidation of butane to maleic anhydride, said process comprising the steps of milling a precursor of the mixed oxide catalyst in the substantial absence of liquid until the mean crystallite size of the catalyst precursor is at most 1000 Angstroms, and subsequently forming the milled catalyst precurosr into catalyst pellets.

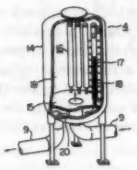
4,496,664

OXINE IMPREGNATED ACTIVATED CHARCOAL METAL ION ADSORBENT

Kenji Motojima, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,415
Claims priority, application Japan, Mar. 31, 1981, 56-46482
Int. Cl.³ B01J 20/26, 20/20; G21F 9/12
U.S. Cl. 502—402 22 Claims

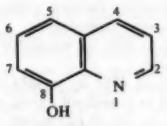




1. A process for preparing a metal ion adsorbent stable at temperatures up to about 300° comprising:

providing activated charcoal;

providing up to about 35 percent by weight based on the weight of the charcoal of an oxine having the following structure:



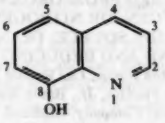
or its derivative substituted at positions 2–7 of the structure;

adsorbing the oxine or its derivative onto the activated charcoal; and

heating the oxine or oxine derivative adsorbed activated charcoal at a temperature of 150° to 200° C., thereby binding the oxine or its derivative to pores of the activated charcoal through polymerization or condensation.

3. A process for preparing a metal ion adsorbent comprising:

(a) adsorbing an oxine having the following structure:



or its derivative substituted at positions 2–7 of the structure; onto activated charcoal;

(b) dipping the material resulting from (a) into an aqueous aldehyde solution or or an aqueous solution of hexamethylenetetramine;

(c) synthesizing methyloloxine from the material resulting from (b) on the activated charcoal in the presence of acid or alkali as a reaction promoter; and

(d) heating the material resulting from (c) to bind it together and to the pores of the activated charcoal through polymerization or condensation.

6. A process according to claim 3, wherein a phenol is also adsorbed in step (b).

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PROCESS FOR CRACKING HIGH-BOILING HYDROCARBONS USING CONTINUOUS ADDITION OF ACIDITY ENHANCING ADDITIVES

William P. Hettinger, Jr., Russell; Stephen M. Kovach, Ashland, and Hubert W. Beck, Russell, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 277,751, Mar. 30, 1981, Pat. No. 4,432,890. This application Mar. 11, 1983, Ser. No. 474,619
Int. Cl.³ B01J 33/00, 21/00
U.S. Cl. 502—521 7 Claims

1. A process for enhancing activity of a cracking catalyst contaminated with heavy metals in the range of about 0.3 to about 3 percent by weight based on the weight of the catalyst comprising contacting said catalyst with a feedstock having heavy metals and high Conradson carbon precursor content and adding to said cracking catalyst continually a metal selected from the group consisting of titanium and zirconium.

2. A process as described in claim 1 in which the additive is a compounds of titanium.

3. A process as described in claim 1 in which the additive is a zirconium compound.

7. A process as described in claim 1 in which the additive is combined with the feedstock prior to introduction to the reactor.

4,496,666

UPGRADING SYNTHESIS GAS

Frederick A. Pesa, Aurora, and Anne M. Graham, Northfield, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 333,218, Dec. 21, 1981, abandoned. This application Dec. 2, 1983, Ser. No. 557,725
Int. Cl.³ C07C 1/04, 27/06
U.S. Cl. 518—706 15 Claims

1. A process for the upgrading of synthesis gas wherein alcohol products are obtained comprising contacting carbon monoxide and hydrogen in the vapor phase at a reaction temperature of at least 250° C. and a reaction pressure of at least 500 psi with a catalyst of the formula

$$A_aRuM_bO_x$$

wherein

A is an alkali metal,

M is Pd, Pt or mixtures thereof, and

wherein

a is about 0.002 to about 2,

b is about 0.1 to about 10, and

x is the number of oxygens needed to fulfill the valence requirements of the other elements.

4,496,667

METHOD FOR CLEANING ORGANICALLY FOULED ANION EXCHANGE RESINS

David W. Reichgott, and Michael J. Leary, both of Richboro, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 15, 1983, Ser. No. 523,246
Int. Cl.³ C08D 5/20; B01J 1/09
U.S. Cl. 521—26 6 Claims

1. In a method of removing organic foulants selected from the group consisting of humic acids, lignins, and tannins from anionic exchange resin beads wherein said foulants have coated the resin beads and have blocked or entered the pores thereof, and wherein said fouled resin is treated with a member or members selected from the group consisting of brine and caustic to aid in removal of said foulants, the improvement comprising also contacting said fouled resin with an aqueous solution comprising consisting essentially of an effective cleaning agent having the formula:

R—O—H

wherein R is alkyl (C_1–C_4).

4,496,668

CELLULAR THERMOSET POLY(DICYCLOPENTADIENE)

Norman R. Newburg, deceased, late of Wilmington, Del. (by Betty Newburg, executrix), assignor to Hercules Corporated, Wilmington, Del.

Continuation of Ser. No. 526,835, Aug. 26, 1983,. This application May 14, 1984, Ser. No. 610,156
Int. Cl.³ C08J 9/14
U.S. Cl. 521—91 5 Claims

1. A cellular thermoset polymer comprised of polymerized units of dicyclopentadiene monomer, wherein the cells of said cellular polymer are small and uniform.

4,496,669

METHOD OF MAKING CELLULAR CROSSLINKED POLY(DICYCLOPENTADIENE)

Douglas R. Leach, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 552,872, Nov. 17, 1983, Pat. No. 4,458,037. This application Jun. 21, 1984, Ser. No. 623,307
The portion of the term of this patent subsequent to Jul. 3, 2002, has been disclaimed.
Int. Cl.³ C08J 9/14; C08F 4/78
U.S. Cl. 521—93 12 Claims

1. A foamed cross-linked polymerized dicyclopentadiene polymer composition comprising:

(a) cross-linked polymerized dicyclopentadiene polymer; and

(b) a dialkylaluminum iodide component.

4,496,670

COATED PARTICULATE FILLERS COMPRISES A PHOSPHINIC ACID GROUP-CONTAINING UNSATURATED ORGANIC POLYMER

Gerson M. F. Vas, Welling, and Leslie E. Shiel, Gravesend, both of England, assignors to Blue Circle Industries PLC, London, England

Filed Nov. 15, 1983, Ser. No. 551,868
Claims priority, application United Kingdom, Nov. 24, 1982, 8233574
Int. Cl.³ C08K 9/00; B32B 5/16
U.S. Cl. 523—205 21 Claims

1. A particulate filler which comprises filler particles to the surface of which there is bound a phosphinic acid group-containing unsaturated organic polymer.

4,496,671

CONTINUOUS CARBON FILAMENT FIBER BUNDLES

Minoru Yoshinaga, and Atsushi Sumida, both of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,065
Claims priority, application Japan, Jul. 14, 1981, 56-108862
Int. Cl.³ C08K 9/00; B32B 9/00
U.S. Cl. 523—206 12 Claims

1. A bundle of continuous carbon filament fibers treated with a sizing agent containing as an active component a water-dispersible resin composition consisting of about 65% to 95% by weight of a water-dispersible urethane compound having at least one epoxy group and at least one quaternary ammonium group and about 5% to 35% by weight an epoxy resin.

11. A carbon fiber-reinforced composite material which comprises at least one resin matrix and the bundle of continuous carbon filament fibers as defined in claim 1.

4,496,672

PROCESS FOR COATING AN ELECTRICALLY CONDUCTIVE SUBSTRATE

Wolfgang Batzill, Münster, and Horst Diefenbach, Nottuln, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern A.G., Hamburg, Fed. Rep. of Germany

Division of Ser. No. 320,504, Nov. 12, 1981, Pat. No. 4,416,753. This application Aug. 30, 1982, Ser. No. 413,145
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044447
Int. Cl.³ C08L 63/00
U.S. Cl. 523—404 10 Claims

1. In an aqueous dispersion comprising a cationic coating agent together with a pulverulent, synthetic resin for coating an electrically conductive substrate connected as a cathode in an electrocoating process and subsequently hardening the coating, the improvement comprising said aqueous dispersion consisting essentially of a mixture of:

(A) said cationic coating agent comprising water-dispersed or water-soluble cationic synthetic resins containing basic groups prepared by reacting resins containing epoxide groups and bases selected from the group consisting of organic amines and Mannich bases followed by protonation with acids to form a carrier resin; and

(B) said pulverulent, synthetic resin comprising dispersed, finely-divided, solid, ionic, plastic powders selected from the group consisting of epoxide resins, polyester resins, acrylate resins, polyurethane resins and polyamide resins having ionic groups selected from the group consisting of ammonium, sulfonium, and phosphonium ions.

4,496,673

CROSSLINKABLE POLYESTER BODY SOLDER OF POWDERED METAL

Paul L. Heater, Jr., Massillon; Nelson C. Bletso, Kent, and William C. T. Tung, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 1, 1982, Ser. No. 432,204
Int. Cl.³ C08K 3/08
U.S. Cl. 523—458 3 Claims

1. A blend of about an equivalent weight of a carboxyl terminated polyester having a carboxyl end group equivalent weight of 900 to 1200 with an 0.8 to 1.2 equivalent weight of an epoxy curing agent having an epoxy equivalent weight of about 70 to 1000, copolyester melt adhesive, and 20 to 70% by weight of metallic powder selected from the class of iron and aluminum, said copolyester melt adhesive having an intrinsic visosity of 0.05 to 1.0 measured at 30° C. in 60/40 phenol/tetrachloroethane and a melting point of 125° to 145° C. to give a blend that adheres to metals and is sandable in solid state to a feathered edge.

4,496,674

GASKET MATERIALS COMPRISING POLYESTER AND RICE HULLS

Wendell A. Ehrhart, Hellam; Ronald S. Lenox, East Hempfield Township, Westmoreland Co., and Moses Sparks, Jr., Manheim Township, Lancaster County, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Nov. 17, 1983, Ser. No. 552,622
Int. Cl.³ C08K 5/00, 11/00
U.S. Cl. 523—500 63 Claims

1. A cured gasket composition obtained from a mixture comprising by weight

100 parts of a rubber binder;

from about 5 to about 1,000 parts of pulverized rice hulls; and

from about 1 to about 200 parts of a polyester derived from at least one monomeric diol and at least one monomeric diacid or acid derivative, said polyester being at least partially crystalline under ambient conditions and having a Tg of from about −50° to about +80° C. and a weight average molecular weight of from about 1,000 to about 500,000.

4,496,675

AQUEOUS DISPERSIONS BASED ON A POLYURETHANE SYNTHETIC RESIN

Hans-Dieter Hille, Bergisch Gladbach, and Rolf Harten, Münster, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,358
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230851
Int. Cl.³ C08L 93/02, 75/12
U.S. Cl. 524—77 21 Claims

1. In an aqueous dispersion based on a polyurethane synthetic resin obtained by reacting (a) a hydroxyl-containing polyester with (b) a diisocyanate to form a first intermediate product and reacting said first intermediate product with (c) a compound which contains at least two groups which react with isocyanate groups and at least one group capable of anion formation to form a second intermediate product, and with a chain-lengthening agent, the improvement comprising:

said hydroxyl-containing polyesters (a) comprising an unsaturated linear polyester or a mixture of an unsaturated linear polyester with a linear diol, said polyester having a molecular weight of 500 to 2,000, said polyester, or said mixture, containing at least 0.4 olefinically unsaturated double bonds per 1,000 molecular weight units, said first intermediate product having terminal isocyanate groups, said second intermediate product having terminal isocyanate groups, said group capable of anion formation having been neutralized by means of a tertiary amine before reaction, said second intermediate product transferred into a predominantely aqueous phase, and said isocyanate groups of said second intermediate product reacted with a diamine, polyamine or mixture thereof having primary amino groups, secondary amino groups or mixtures thereof, and subsequently added to said aqueous phase, as a further binder, base-hydrolyzed shellac, where in each case, based on the solids content, said polyurethane synthetic resin content is 40 to 70% by weight, said hydrolyzed shellac content is 60 to 30% by weight, and said polyurethane synthetic resin content and said hydrolyzed shellac content add up to 100%.

2. The dispersion of claim 1, which contains wetting agents, emulsifiers or mixtures thereof in an amount of 1 to 25% by weight, based on the total weight of dispersion.

3. The dispersion of claim 2, wherein said unsaturated polyester is a polyester of maleic anhydride and a diol.

4. The dispersion of claim 3, wherein said diisocyanate is aliphatic, cycloaliphatic or a mixture thereof.

5. The dispersion of claim 4, wherein said compound (c) is a dihydroxycarboxylic acid or a dihydroxysulfonic acid.

4,496,676

ULTRAVIOLET-ABSORBING STABILIZERS SUBSTITUTED BY AN ALIPHATIC HYDROXYL GROUP

Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 318,648, Nov. 5, 1981, Pat. No. 4,414,393.
This application Sep. 30, 1982, Ser. No. 431,499
Int. Cl.³ C08L 77/10
U.S. Cl. 524—99 8 Claims

1. An ultraviolet-absorbing, matrix-reactive compound having the formula

$$E—(G—R)_n \quad (I)$$

$$L—(G—E)_m \quad (II)$$

or

$$[G—E_1—G—Q]_p \quad (III)$$

wherein

E or E_1 is a radical derived from an oxanilide,

G is $—OCH_2—CHOH—$ where E or E_1 is attached to the oxygen atom,

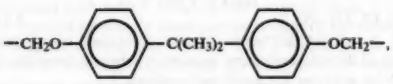
R is alkyl of 1 to 18 carbon atoms, phenyl, p-tolyl or $—CH_2OT$ where

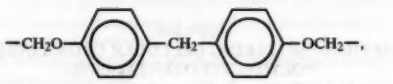
T is alkyl of 1 to 20 carbon atoms or alkenyl of 3 to 20 carbon atoms,

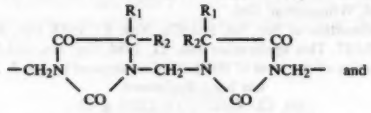
n is 1 or 2

m is 2 or 3,

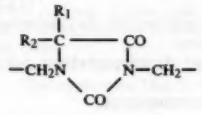
L, when m is 2, is a direct bond, alkylene of 1 to 6 carbon atoms, phenylene, or a radical selected from the group consisting of







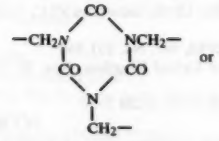
and



where

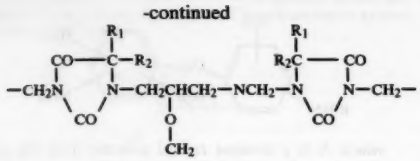
R_1 and R_2 are independently alkyl of 1 to 6 carbon atoms or together are tetramethylene or pentamethylene, or

L, when m is 3, is



or

-continued



Q has the same meaning as L where m is 2, and p is 1 to 4.

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STABILIZED FLUOROPOLYMER COMPOSITION

James E. Briggs, Jr., Hackettstown; Kwang-Ho Chu, Flemington, and Daniel C. Chung, Bridgewater, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

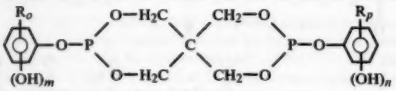
Filed Feb. 16, 1984, Ser. No. 580,964

Int. Cl.³ C08L *27/12*

U.S. Cl. 524—108 **8 Claims**

1. A stabilized fluoropolymer composition having improved thermal stability which comprises a melt processable fluoropolymer, and

(a) 0.2 percent to 3 percent by weight of the polymer of hindered phenol pentaeythritol diphosphite having the general formula:



wherein the R substituents, which may be the same or different, are independently selected from the group consisting of hydrogen and alkyl, straight or branched chain, having from 1 to about 18 carbon atoms; and wherein m and n are integers from 1 to 2, and o and p are integers from 1 to 5, with the proviso that the sums of m+o, and n+p may not exceed 5, and

(b) 0.01 percent of 3.0 percent by weight of the polymer of a salt of a monocarboxylic acid having from 6 to 24 carbon atoms and a metal of Group II of the Periodic Table.

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VISCOSITY STABILIZED DISPERSIONS

Wolfgang D. Wenzel, New Martinsville, and Michael N. Carmosino, Moundsville, both of W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 21, 1984, Ser. No. 612,278

Int. Cl.³ C08K *5/05*

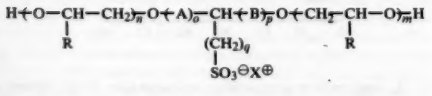
U.S. Cl. 524—157 **6 Claims**

1. A composition comprising:

(a) a dispersion of a polyurea and/or polyhydrazodicarbonamide in a relatively high molecular weight organic compound containing at least two hydroxyl groups, wherein the concentration of the polyurea and/or polyhydrazodicarbonamide is from 1 to 40% by weight of the dispersion.

(b) from 2 to 10% by weight of water based on the weight of component (a), and

(c) from 3 to 10% by weight based on the weight of components (a) and (b), of a sulphonate diol corresponding to the formula:



wherein

A and B may be the same or different and represent a difunctional aliphatic hydrocarbon radical containing from 1 to 6 carbon atoms;

R represents hydrogen, an aliphatic hydrocarbon radical containing from 1 to 4 carbon atoms, or a phenyl radical;

X⊕ represents an alkali metal cation, or an ammonium group which may be substituted;

n and m represent the same or different numbers of from 1 to 30;

o and p each represent 0 or 1; and

q represents 0, 1 or 2.

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STABILIZATION OF POLYPHENYLENE ETHER SOLUTIONS

Juergen Hambrecht, Heidelberg; Rudi W. Reffert, Beindersheim; Adolf Echte, and Johann Swoboda, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

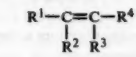
Filed Sep. 13, 1983, Ser. No. 531,656

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234034

Int. Cl.³ C08L *71/04*

U.S. Cl. 524—111 **5 Claims**

1. A process for the stabilization of solutions of high molecular weight polyphenylene ethers, which solutions are formed by conducting an oxidative coupling reaction of oxygen and a monohydric phenol at a temperature of from 15° to 50° C. in the presence of a catalyst complex of a copper salt and an organic amine in the presence of a solvent in a weight ratio of from 1:1 to 20:1, based on the monomeric phenol, said monohydric phenol having alkyl substituents in the two ortho-positions and optionally in the meta-positions but not in the para-position, which stabilization process comprises: contacting the formed reaction solution containing the high molecular weight polyphenylene ethers with from 0.1 to 100 mmoles per mole of monomeric phenol of a compound of the structure



(I)

where R^2 and R^3 can be identical or different and each is OH, NH_2, NHR^5, where R^5 is alkyl or cycloalkyl, or SH, and R^1 and R^2 are identical or different, being hydrogen, alkyl, cycloalkyl, aryl, carbonyl, carboxyl, carboxyalkyl or nitrile, and can be linked to form a ring.

4,496,680

SILICONE FLAME RETARDANTS FOR NYLON

Bruce A. Ashby, Schenectady, N.Y., assignor to General Electric Company, NY, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,293

Int. Cl.³ C08L *77/00*

U.S. Cl. 524—265 **43 Claims**

1. A flame retardant composition comprising:

(a) about 50 to about 90 percent by weight of one or more nylon materials, and

(b) about 10 to about 50 percent by weight of a composition effective for imparting flame resistance comprising:

(i) about 20 to about 75 percent by weight based on (b) of diphenylsilanediol, low molecular weight phenyl substituted siloxane diol, or mixture thereof;

(ii) about 3 to about 30 percent by weight based on (b) of Group IIA metal carboxylic acid salt;

(iii) about 10 to about 60 percent by weight based on (b) of aluminum trihydrate; and

(iv) about 10 to about 50 percent by weight based on (b) of organic halide.

4,496,681

FIRE RETARDANT CONCENTRATE

Frank E. Lordi, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 31, 1980, Ser. No. 221,858
Int. Cl.³ C08K 5/06
U.S. Cl. 524—371 **2 Claims**

1. A fire retardant concentrate consisting essentially of the combination of:

about 45% to about 55% of a radial block copolymeric resin having about 50 to about 80% styrene and about 50 to about 20% alkadiene,

about 30% to about 45% ether having two brominated phenyl groups said ether being selected from the group consisting of brominated phenyl ether and 1, 2, bis-phenoxy ethane having two brominated phenyl groups,

about 10 to about 25% antimony trioxide, and about 0.05 to about 5% modifiers comprising about 0.05 to about 0.15% antioxidant phenol having stericlly hindering alkyl substituents, said concentrate being pelleted, said pellets of concentrate being blendable with pellets of styrene-maleic anhydride copolymeric resin to provide blends having a slower burning rate than products made from said styrene-maleic anhydride pellets.

4,496,682

CURABLE FLUOROPOLYMER CONTAINING AROMATIC AMINE

Walter W. Schmiegel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 500,055, Jun. 1, 1983, abandoned. This application Feb. 29, 1984, Ser. No. 584,582
Int. Cl.³ C08L 27/16
U.S. Cl. 524—545 **15 Claims**

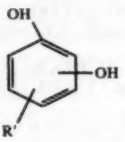
1. A fluoroelastomer composition comprising:

A. An elastomeric copolymer of vinylidene fluoride and at least one other fluorinated monomer,

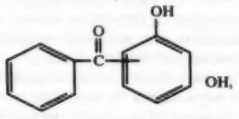
B. a vulcanization accelerator selected from the class consisting of quaternary phosphonium compounds and quaternary ammonium compounds,

C. a metal compound selected from the group consisting of divalent metal oxides, divalent metal hydroxides, and mixtures of such oxides or hydroxides with metal salts of weak acids,

D. a press-cure crosslinking agent selected from the class consisting of a bisphenol or an ammonium or a phosphonium salt thereof or a polyhydroxy phenol of the formula:

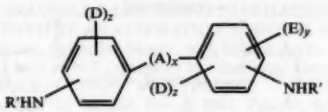


where R′ is H or akyl or aryl, or of the formula:

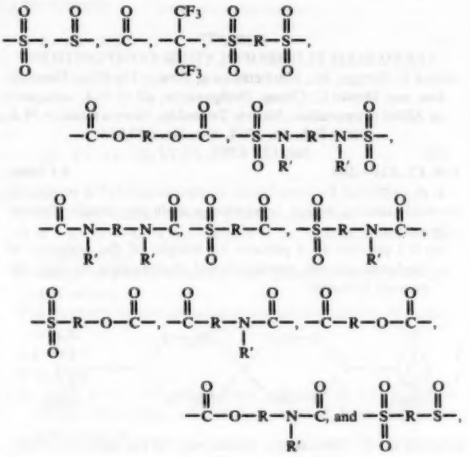


and

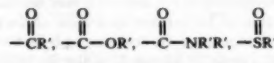
E. a postcure cross-linking agent having the formula:



where A is a divalent radical selected from the group consisting of



and x is zero or 1, but if x is zero then y is not zero; E is selected from the group consisting of



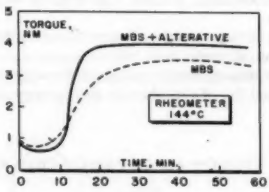
F, Cl, Br, I, $—CF_3$, $—NO_2$, and —CN; D is selected from the class consisting of R′ and E; R is alkylene, or arylene; R′ is alkyl, aryl or H; and y is zero, 1, 2, 3 or 4; and z is zero, 1, 2, 3, or 4.

4,496,683

RUBBER COMPOSITIONS CONTAINING A VULCANIZATION SYSTEM ALTERATIVE

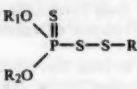
Eiichi Morita, Mililani Town, Hi., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 11, 1982, Ser. No. 407,028
Int. Cl.³ C08K 3/04
U.S. Cl. 524—571 **12 Claims**



1. A composition comprising vulcanizable diene rubber, a cross-linking agent, a vulcanization accelerator selected from azoles, sulfenamides, thioureas, thiurams, xanthates, dithiocar-

bamates and guanidines and from 0.1 to 5.0 parts by weight per 100 parts of the rubber by weight of a vulcanization system alterative of the formula



wherein R_1 and R_2 are the same or different radicals selected from alkyl of 1–12 carbon atoms, phenyl, cycloalkyl of 3–8 carbon atoms and alkaryl and aralkyl of 7–12 carbon atoms, and R_3 is selected from the same radicals as R_1 or R_2, optionally substituted with one or more halogen, nitro, alkoxy, carboalkoxy, acyl, acyloxy, amido, cyano, thio or sulfonyl substituents.

4,496,684

URETDIONE GROUP-CONTAINING POLYURETHANE OLIGOMERS AND AQUEOUS DISPERSIONS THEREOF

James M. O'Connor, Clinton, and Wilhelm J. Schnabel, Branford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 1, 1984, Ser. No. 616,349
Int. Cl.³ C08G *18/38*
U.S. Cl. 524—591 **25 Claims**

1. A process for preparing a polyurethane oligomer, comprising the steps of:

(a) reacting a uretdione group-containing organic polyisocyanate with an isocyanate reactive hydrogen atom-containing compound in an equivalent ratio of NCO to OH ranging from about 1/6 to about 1/1.8 to form a hydroxyl-terminated prepolymer, said isocyanate reactive hydrogen atom-containing compound having a molecular weight from about 62 to about 7,000 and an average functionality from about 2 to about 8; and

(b) reacting said hydroxyl-terminated prepolymer with a dicarboxylic acid anhydride to form a polyurethane oligomer having a final free OH content from about 0.2 to about 10 percent and a carboxylic acid group content from about 0.6 to about 13 percent.

4,496,685

ADHESIVE COMPOSITION

Takashi Nagasawa, Daito, and Tiaki Nakata, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited and Taoka Chemical Company, Limited, both of Osaka, Japan

Filed Jun. 7, 1984, Ser. No. 618,413
Int. Cl.³ C08K *5/49*
U.S. Cl. 524—708 **7 Claims**

1. An adhesive composition comprising an alpha-cyanoacrylate monomer and a phosphazene compound incorporated therein.

4,496,686

RADIATION-CURABLE COATINGS CONTAINING REACTIVE PIGMENT DISPERSANTS

Robert E. Ansel, Des Plaines, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed May 7, 1984, Ser. No. 607,790
Int. Cl.³ C08K *3/10*
U.S. Cl. 524—850 **12 Claims**

1. A liquid coating composition adapted to be cured by exposure to ionizing radiation comprising, a liquid vehicle of coating viscosity having an ethylenically unsaturated portion comprising one or more polyethylenically unsaturated materials adapted to cure on radiation exposure, pigment dispersed in said vehicle, and an ethylenically unsaturated radiation-curable dispersant containing a carboxy group for wetting said pigment and assisting in the stable dispersion of said pigment in said vehicle, said dispersant being a half amide or half ester of an ethylenically unsaturated polycarboxylic acid anhydride with an organic compound having a molecular weight of from 100 to 4000 and which contains a single hydroxy group or a single amino group as the sole reactive group thereof.

4,496,687

AQUEOUS EMULSION-TYPE SILICONE COMPOSITIONS

Fumio Okada; Toshio Oba, and Morizo Nakazato, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 444,206, Nov. 24, 1982, abandoned. This application Jan. 27, 1984, Ser. No. 574,669
Claims priority, application Japan, Nov. 27, 1981, 56-190115
Int. Cl.³ C08L *83/02*
U.S. Cl. 524—859 **12 Claims**

1. An organopolysiloxane-containing aqueous emulsion composition which comprises

(A) an aqueous organopolysiloxane emulsion comprising

(A-1) 100 parts by weight of an organopolysiloxane having at least two hydroxy groups directly bonded to the silicon atoms in a molecule,

(A-2) from 0.3 to 20 parts by weight of an anionic surface active agent, and

(A-3) water as the dispersing medium of the components (A-1) and (A-2),

(B) from 1 to 60 parts by weight as solid of a uniform dispersion comprising

(B-1) from 0.1 to 20% by weight, based on the component (B-2) mentioned below as solid, of a reaction product of a carboxylic acid anhydride with an organosilane having a functional amino group in a molecule or a hydrolysis product thereof, and

(B-2) a colloidal silica in an aqueous suspension,

(C) a catalytic amount of a curing catalyst.

4,496,688

HEAT RESISTANT POLYESTER(AMIDE) COMPOSITION

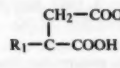
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1983, Ser. No. 477,102
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.³ C08L *67/06, 77/10*
U.S. Cl. 525—44 **8 Claims**

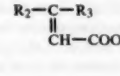
1. A curable resinous composition comprising

A. about 5 to about 95 weight percent of an unsaturated polyester, an unsaturated polyesteramide, or a mixture thereof

B. about 95 to about 5 weight percent of an unsaturated mixture consisting of 15 to 85 weight percent of an ethylenically unsaturated monomer and 85 to 15 weight percent of a non-halogenated dicyclopentadiene or polycyclopentadiene bis or tris ester of an unsaturated polycarboxylic acid having one of the formulae



I.



II.

where

R_1 is $=CH_2$ or $=C(CH_3)—CH_3$

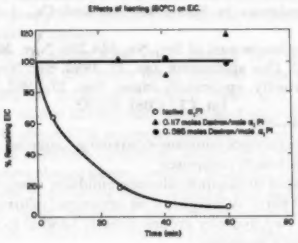
R_2 is hydrogen or $—CH_2—COOH$

R_3 is hydrogen when R_2 is a $—CH_2—COOH$ group, or $—COOH$.

4,496,689
COVALENTLY ATTACHED COMPLEX OF ALPHA-1-PROTEINASE INHIBITOR WITH A WATER SOLUBLE POLYMER

Gautam Mitra, Kensington, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 27, 1983, Ser. No. 565,810
Int. Cl.³ C07G 7/00
U.S. Cl. 525—54.1 **45 Claims**


Effects of heating (60°C) on EIC.
% Remaining EIC
Time (min)
0 buffer only
▲ 0.17 moles Dextran/mole α₁PI
● 0.385 moles Dextran/mole α₁PI

1. A process for producing a covalently attached complex of alpha-1-proteinase inhibitor with a water soluble polymer having hydroxy groups pendant to the polymer backbone, which hydroxy groups and amino groups pendant to alpha-1-proteinase inhibitor are chemically reactive with a polyfunctional coupling compound, comprising the steps of:

(a) contacting the water soluble polymer having hydroxy groups pendant to the polymer backbone, which hydroxy groups are chemically reactive with a polyfunctional coupling compound, with a polyfunctional coupling compound having functional groups which are reactive with said hydroxy groups in a chemical activation reaction to obtain an activated intermediate which is reactive with amino groups pendant to the protein, alpha-1-proteinase inhibitor; and

(b) contacting the activated intermediate from step (a) with alpha-1-proteinase inhibitor in a chemical coupling reaction to effect covalent attachment and to thereby obtain a covalently attached complex of alpha-1-proteinase inhibitor with the water soluble polymer.

4,496,690
ALLOYS OF STYRENIC RESINS AND POLYAMIDES

Thomas S. Grant, and Charles L. Myers, both of Vienna, W. Va., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 326,149, Nov. 30, 1981, abandoned. This application Jun. 3, 1983, Ser. No. 500,719
Int. Cl.³ C08L 77/00
U.S. Cl. 525—66 **7 Claims**

1. A polymer composition comprising from 5 to 95 wt.% of a polyamide and correspondingly from 95 to 5 wt% of a resin selected from the group consisting of copolymers consisting of a styrene, an acrylonitrile and an ethylenically-unsaturated carbonamide, and graft polymers thereof on a rubbery substrate polymer, said resin having incorporated therein from about 0.5 to about 15 parts by weight of said copolymerizable ethylenically-unsaturated carbonamide per hundred parts by weight resin.

4,496,691
ADDITIVES FOR LUBRICATING OILS CONTAINING STYRENE AND HEAVY C_{12}–C_{20} ALKYL ESTERS OF METHACRYLIC ACID, PREPARATION METHOD AND APPLICATIONS

Yves Proux, Paris, and Alain Perron, Herblay, both of France, assignors to Societe Francaise d'Organo-Synthese, Gennevilliers, France

Filed Jan. 8, 1982, Ser. No. 338,001
Claims priority, application France, Jan. 12, 1981, 81 00410
Int. Cl.³ C08L 39/04, 51/00
U.S. Cl. 525—73 **18 Claims**

1. An additive for lubricating oils, comprising a random copolymer consisting of a polymerized mixture of styrene or lower alkyl-substituted styrene, at least one C_{12}–C_{20} alkyl ester of methacrylic acid selected from the group consisting of C_{12}–C_{15} alkyl esters of methacrylic acid and C_{16}–C_{20} alkyl esters of methacrylic acid, and an ester of methacrylic acid selected from the group consisting of dialkylaminoalkyl esters of methacrylic acid;

said copolymer in addition having grafted onto it at least one dispersing monomer selected from the group consisting of N-vinylpyrrolidone, N-vinylimidazole, N-vinyl-2H-pyridine, and other N-vinyl monomers containing a nitrogen function, thereby producing a modified copolymer;

said alkyl esters of methacrylic acid containing at least 80% by weight of the C_{16}–C_{20} alkyl esters of methacrylic acid relative to the total alkyl esters of methacrylic acid employed;

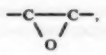
said modified copolymer containing between 35 and 55% by weight of styrene or lower alkyl-substituted styrene, and having a polydispersity of from 1 to about 2.5, a solubility parameter of about 8, and a weight average molecular weight between 80,000 and 200,000.

4,496,692
MOLDING COMPOSITIONS OF POLYVINYL CHLORIDE AND POLYMERIZABLE PLASTICIZERS

Changkiu K. Riew, and Frank H. Howard, both of Akron, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 30, 1983, Ser. No. 567,285
Int. Cl.³ C08L 63/02, 27/22
U.S. Cl. 525—112 **6 Claims**

1. In a molding composition of polymeric materials containing polyvinyl chloride copolymers or homopolymers, free-radically polymerizable plasticizers, and a free radical initiator, the improvement which essentially comprises (1) one or more dehydrochlorinating agents, (2) one or more ionically polymerizable monomers and/or macromers containing the oxirane group



and (3) one or more heterofunctional monomers containing at least one oxirane group and at least one $CH_2{=}C<$ group per molecule.

4,496,693
COMPATIBILIZATION OF POLYCARBONATE BLENDS

Niles R. Rosenquist, Evansville, and John A. Tyrell, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 1, 1983, Ser. No. 557,006
Int. Cl.³ C08L 69/00
U.S. Cl. 525—146 **18 Claims**

1. A composition comprising an admixture of

a. an aromatic carbonate polymer,

b. a polyolefin or modified polyolefin in sufficient quantity to impact modify the aromatic carbonate polymer, and

c. an amount of catalyst sufficient to compatibilize a and b

selected from the group consisting of hydroxides, oxides and amides of alkali and alkaline earth metals.

4,496,694

PROCESS FOR PRODUCING A STORAGE-STABLE, MISCIBLE CURING AGENT FOR ACRYLATE RESIN ADHESIVES

Imre Forgò , Birsfelden, Switzerland, and Jacques Francois, Huningue, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 18, 1983, Ser. No. 485,933
Claims priority, application Switzerland, Apr. 27, 1982, 2566/82; Dec. 27, 1982, 7561/82
Int. Cl.³ C08L *61/28*
U.S. Cl. 525—163 15 Claims

1. A process for producing a storage-stable curing agent for reactive acrylate adhesives, which curing agent is miscible with an acrylate resin adhesive, which process comprises

(a) adding to a polymerisable monomer containing an olefinic group or groups, at a temperature of 50°to 100° C., a thermoplast or elastomer, which is soluble in said monomer, and which is selected from the group consisting of a polyacetal, polyacrylate, polymethacrylate, polystyrene, polyamide, copolymer of styrene and an acrylate, copolymer of styrene and a methacrylate, copolymer of styrene and butadiene, copolymer of styrene and isoprene, terpolymer of styrene, butadiene and acrylonitrile, polyurethane, butyl rubber and butadiene/acrylonitrile copolymer, in an amount of 5 to 85% by weight, relative to the amount of curing agent;

(b) introducing into the thickened solution formed in step (a) a liquid aldehyde/amine condensation product; and

(c) homogenising the solution mixture of step (b) at elevated temperature.

4,496,695

CURABLE RESIN COMPOSITION

Akitoshi Sugio, Saitama; Masanobu Masu, Tokyo, and Masatugu Matunaga, Tonemachi, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 352,029
Claims priority, application Japan, Feb. 28, 1981, 56-28972
Int. Cl.³ C08F *283/08;* C08L *71/04, 63/00*
U.S. Cl. 525—391 11 Claims

1. A curable resin composition, comprising:

(a) a polyphenylene ether resin;

(b) a component selected from the group consisting of:

a polyfunctional cyanate ester compound having at least two cyanate groups; and

a mixture of a polyfunctional cyanate ester compound and a polyfunctional maleimide compound;

wherein said polyfunctional cyanate ester compound is selected from the group consisting of:

(1) a polyfunctional cyanate ester monomer having at least two cyanate groups,

(2) a prepolymer of (1),

(3) a coprepolymer of (1) and an amine,

(4) a coprepolymer of (1) and a polyfunctional maleimide, and

(5) mixtures thereof;

and

said polyfunctional maleimide compound is selected from the group consisting of:

(i) a polyfunctional maleimide,

(ii) a prepolymer of a polyfunctional maleimide,

(iii) a coprepolymer of a polyfunctional maleimide and an amine, and

(iv) mixtures thereof;

and

(c) an epoxy compound;

said composition including a mixture of components (a), (b) and (c), a preliminary reaction product of components (a), (b) and (c), the combination of said mixture and said preliminary reaction product, and the combination of (a) and the preliminary reaction product of (b) and (c); wherein the amount of (a) is in the range of 4–95 wt% and the amount of (b)+(c) is in the range of 96–5 wt% on the basis of the total amount of (a), (b) and (c).

4,496,696

SILICONE SEALANT COMPOSITION

Atsushi Kurita, Ota, Japan, assignor to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1983, Ser. No. 560,071
Claims priority, application Japan, Dec. 15, 1982, 57-220816
Int. Cl.³ C08F *8/00*
U.S. Cl. 525—479 9 Claims

1. A silicone sealant composition comprising

(A) 100 parts by weight of a silanol terminated polydiorganosiloxane having a viscosity of 100 to 200,000 cSt at 25° C.,

(B) 0.1 to 30 parts by weight of an aminoxy group-containing organosilicon compound containing, on the average, more than two organoaminoxy groups per molecule,

(C) 5 to 300 parts by weight of an inorganic filler, and

(D) 1 to 30 parts by weight of an ultraviolet-curable oligomer containing acryl groups.

4,496,697

AUTOMATIC PROCESS CONTROL SYSTEM FOR CURING POLYMERIC MATERIAL

Andrew Zsolnay, Manhattan Beach, Calif.; Kelly M. Perkins, Anchorage, Ak., and Leiv H. Blad, Van Nuys, Calif., assignors to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 220,369, Dec. 29, 1980, Pat. No. 4,399,100.
This application Aug. 24, 1982, Ser. No. 411,111
Int. Cl.³ C08J *3/00, 3/24*
U.S. Cl. 526—60 8 Claims

1. An improved method of automatically controlling curing of a thermosetting polymeric material comprising:

(a) applying heat to the polymeric material to initiate curing;

(b) measuring a selected characteristic of the polymeric material at various times during the curing thereof;

(c) generating a set of signals corresponding to the measurements made;

(d) determining from said signals the optimum time after the initiation of curing but before the polymeric material has hardened for applying pressure to the polymeric material; and

(e) automatically applying pressure to the polymeric material at said optimum time, in a closed-loop system.

4,496,698

PROCESS FOR PRODUCING POLYETHYLENE HAVING CONSTANT PHYSICAL AND CHEMICAL PROPERTIES

Jan L. J. Adriaans, Hulst, and Pieter G. Dees, Terneuzen, both of Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 26, 1982, Ser. No. 401,769
Int. Cl.³ C08F *10/02*
U.S. Cl. 526—64 3 Claims

1. A process for producing polymers or copolymers of ethylene in which ethylene, optionally together with one or more copolymerizable, unsaturated compounds, is polymerized at a total system pressure above 50,000 kPa and a temperature of between 100° and 400° C. in the presence of an initiator, and using a stirred autoclave reactor and a non-cooled tubular reactor connected in series with said autoclave reactor, characterized by passing a monomeric mixture in the presence of the initiator first into said autoclave in which it is partially polymerized, and thereafter discharging the reaction mixture from said autoclave, and passing it through a heat exchanger in which it is cooled to a predetermined value ranging between 220° and 250° C., and subsequently passing the reaction mix-

ture to said non-cooled tubular reactor, in which the further polymerization is carried out under adiabatic conditions.

4,496,699

PROCESS FOR POLYMERIZING HIGH MELT INDEX OLEFINS AND POLYMERIZATION CATALYSTS USED THEREFORE

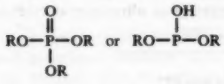
Louis J. Rekers, Wyoming, and Stanley J. Katzen, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 243,677, Mar. 31, 1981, Pat. No. 4,379,075. This application Nov. 12, 1982, Ser. No. 440,889

Int. Cl.³ C08F *4/24, 10/00*

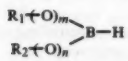
U.S. Cl. 526—105 **6 Claims**

1. A process for the polymerization of an olefin to provide a polyolefin of high melt index which comprises contacting the olefin with a catalyst system obtained by heat activating a supported organophosphoryl chromium compound obtained by the reaction of chromium trioxide with an organphosphorous compound having the formula:



wherein

R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen, but at least one R is other than hydrogen, and combining the heat activated supported material with a melt index increasing amount of at least one organoborane catalyst modifier having the formula:



wherein

m and n each is zero or 1, with the proviso that m and n are not both zero,

R_1 and R_2 are each a hydrocarbyl group of from 1 to 10 carbon atoms, or one of R_1 and R_2 is hydrogen, or together R_1 and R_2 constitute a hydrocarbyl group of from 2 to 10 carbon atoms.

4,496,700

POLYMERIZATION OF HALOALKYNES BY A NICKEL CATALYST

Ismael Colon, Piscataway, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 8, 1983, Ser. No. 521,452

Int. Cl.³ C08F *4/44, 4/72*

U.S. Cl. 526—111 **11 Claims**

1. Method of synthesizing highly conjugated, polyunsaturated organic polymers which consists essentially of contacting a haloalkyne having 3 to about 18 carbon atoms where the halogen constituent can be Cl, Br or I with a catalyst mixture in the presence of a reducing metal selected from the group consisting of zinc, magnesium and manganese or mixtures thereof in a dipolar aprotic solvent in which said haloalkyne is soluble, under essentially anhydrous conditions for a period of time and at a temperature sufficient to couple said haloalkyne until normally solid macromolecules are produced, wherein the catalyst mixture comprises an anhydrous nickel compound and at least one ligand selected from the group consisting of a triarylphosphine having from about 6 to about 14 carbon atoms in each aryl moiety and an aromatic bidentate compound containing at least one ring nitrogen atom and from about 5 to about 30 carbon atoms and wherein the ratio of gram atoms of nickel per mole of haloalkyne is from about 0.001 to about 0.01, the amount of ligand is from about 1 to about 50 moles per gram atom of nickel and the amount of reducing metal is at least about 0.5 mole of reducing metal per mole of haloalkyne.

4,496,701

PHOSPHORUS-CONTAINING IMIDE RESINS

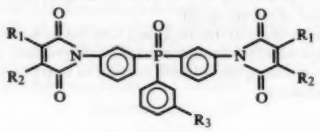
Indra K. Varma, New Delhi, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 288,267, Jul. 30, 1981, Pat. No. 4,395,557, which is a continuation-in-part of Ser. No. 175,452, Aug. 5, 1980, Pat. No. 4,276,344. This application Jun. 9, 1983, Ser. No. 502,820

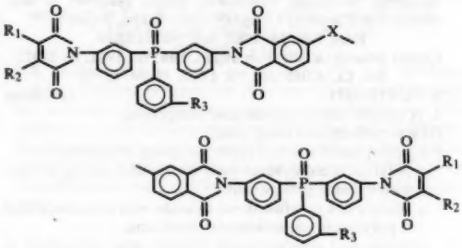
Int. Cl.³ C08F *20/70, 30/02*

U.S. Cl. 526—262 **13 Claims**

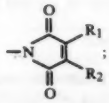
1. A resinous polymer of a monomer selected from imides having the structure



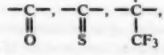
or from imides having the structure



wherein R_1 and R_2 are selected from the group consisting of hydrogen, chloro and lower alkyls; R_3 is the amino group or the imide group



X is a valence bond or X is a divalent linking radical selected from the group consisting of —O—, —S—,



—SO_2— and —C_nH_{2n}— wherein n is 1, 2, or 3.

4,496,702
POLYACETYLENE PRODUCTION

David C. Bott, Woking; John H. Edwards, Stockton-on-Tees, and William J. Feast, High Shincliffe, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Nov. 16, 1982, Ser. No. 442,147
Claims priority, application United Kingdom, Nov. 20, 1981, 8134975
Int. Cl.[3] C08F *138/02*
U.S. Cl. 526—285 4 Claims

1. A coherent poly(acetylene) film, characterized in that said film is a solid film with no voids and with no basic structural units being visible under a scanning electron microscope at a magnification of 10,000 times.

4,496,703
PROCESS FOR RECOVERING AMINO ACIDS FROM PROTEIN HYDROLYSATES

Walter Steinmetzer, Süpplingen, Fed. Rep. of Germany, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Division of Ser. No. 327,593, Dec. 4, 1981, Pat. No. 4,384,136, which is a continuation of Ser. No. 119,111, Feb. 6, 1980, abandoned. This application Dec. 27, 1982, Ser. No. 452,905
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2906034
Int. Cl.[3] C07C *99/12*
U.S. Cl. 562—443 6 Claims

1. A process for recovering leucine, isoleucine, phenyl-alanine, tyrosine and valine from an acid protein hydrolysate containing amino acids comprising the steps of:
(a) forming a solution of amino acid hydrochlorides from the acid protein hydrolysate;
(b) saturating the solution with sodium chloride; and then
(c) extracting from the saturated solution the hydrochlorides of leucine, isoleucine, phenyl-alanine, tyrosine and valine with a water-immiscible alcohol.

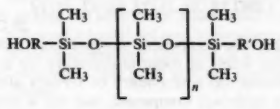
2. A process for separating phenyl-alanine and tyrosine from a solution of amino acid hydrochlorides containing phenyl-alanine hydrochloride and tyrosine hydrochloride comprising the steps of:
(a) passing the solution of amino acid hydrochlorides over a weakly basic anion exchanger to obtain a neutral solution of amino acids; and then
(b) passing the solution of amino acids over a strongly basic anion exchanger of hydroxide form thereby adsorbing and separating the phenyl-alaninne and tyrosine from the solution of amino acids.

4,496,704
HIGH SLIP POLYESTER FILMS CONTAINING SILOXANE UNITS

Paul R. Ginnings, Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

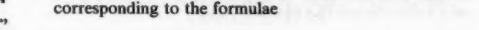
Filed Mar. 7, 1983, Ser. No. 472,514
Int. Cl.[3] C08G *63/46, 77/46*
U.S. Cl. 528—26 9 Claims

1. A polyester film which has excellent slip characteristics and excellent haze values which is comprised of a random, linear, thermoplastic block copolyester consisting essentially of the polymeric reaction product of a mixture of reactants comprising
(A) at least one reactant selected from the groups of reactants consisting of
(1) aromatic dicarboxylic acids or the C_1 to C_4 dialkyl esters thereof and
(2) aliphatic dicarboxylic acids or the C_1 to C_4 dialkyl esters thereof
wherein the reactant selected from group (1) constitutes from 100 to 50 mol percent of the total mols of reactant (A) and the reactant selected from group (2) constitutes from 0 to 50 mol percent of the total mols of reactant (A);
(B) from about 100 to about 300 mol percent, based on the total mols of reactant (A) of at least one reactant selected from the group consisting of alkylene glycols containing from 2 to 10 carbon atoms; and
(C) from about 5.00 to about 12.0 weight percent, based on the weight of the polymeric reaction product, of a dihydroxy terminated polydimethylsiloxane block copolymer of the general formula



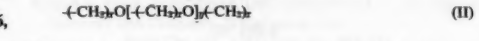
(I)

wherein n is an integer ranging from about 8 to about 15 and R and R' are divalent polymethylene oxide radicals corresponding to the formulae



(II)

and



(III)

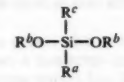
respectively and wherein x is an integer ranging from about 2 to about 8 and y is an integer ranging from about 8 to about 15 to provide said block copolymer with a molecular weight ranging from about 1600 to about 5500; wherein said polyester film has been biaxially oriented and has a kinetic coefficient of friction of less than 0.55 and a haze value of from 3.5% to 14% as determined by ASTM Test D-1003.

4,496,705
SYNTHESIS OF ZWITTERIONIC SILOXANE POLYMERS

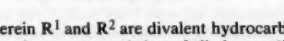
Robert A. Florence, Scotia; John R. Campbell, Clifton Park, and Robert E. Williams, Jr., Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,018
Int. Cl.[3] C08G *77/04*
U.S. Cl. 528—34 12 Claims

1. A method of producing aminoalkyl-siloxane polymers comprising the steps of:
(A) hydrolyzing difunctional aminoalkylsilane of the formula



(B) removing a substantial portion of the alcohol coproduct from the hydrolysis reaction mixture of step (A) and
(C) polymerizing hydroxy-terminated siloxane oligomers with the aminoalkyl-silane in the remaining hydrolysis reaction mixture of step (B); wherein each R^b is a monovalent hydrocarbon radical independently selected from the group consisting of alkyl radicals of from 1 to 20 carbon atoms and aryl radicals of from 6 to 20 carbon atoms, R^a is an aminoalkyl radical of the general formula:



wherein R^1 and R^2 are divalent hydrocarbon radicals selected from the group consisting of alkylene radicals of from 1 to 10 carbon atoms and divalent aryl radicals of from 6 to 20 carbon atoms and n is an integer of from 0 to 5 inclusive, and R^c is a

monovalent radical selected from the group consisting of hydrogen, alkyl radicals of from 1 to 20 carbon atoms, aryl radicals of from 6 to 20 carbon atoms and the aminoalkyl radicals within the scope of R^a.

4,496,706

ONE-COMPONENT POLYURETHANE ADHESIVE COMPOSITIONS

Eugene Y. C. Chang, 532 Rolling Hills Rd., Bridgewater, N.J. 08807

Filed Apr. 11, 1983, Ser. No. 483,983
Int. Cl.³ C08G *18/10, 18/22, 18/62, 18/14*
U.S. Cl. 528—57 **20 Claims**

1. A heat-curable one-component polyurethane adhesive composition, storage stable at room temperature for at least four weeks comprising: (a) a secondary or tertiary aliphatic diisocyanate; (b) a hydroxyl compound; and (c) a curingly effective amount of a catalyst selected from the group consisting of magnesium acetylacetonate, nickel acetylacetonate, magnesium stearate, cadmium stearate, and organic acid salts of 1,8-diazabicyclo[5.4.0]undec-7-ene.

4,496,707

POLYURETHANE AND METHOD FOR MAKING STABLE COMPONENTS THEREOF

Paul E. Liggett, Wooster, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jun. 9, 1983, Ser. No. 502,832
Int. Cl.³ C08L *75/06*
U.S. Cl. 528—61 **18 Claims**

1. A process for preparing a urethane formulation, comprising the steps of:

separately preparing a polymer component, said polymer component comprising a urethane prepolymer and a urethane solvent;

the amount of said urethane prepolymer in said urethane component is about 100 parts by weight, wherein said urethane prepolymer is the reaction product of (1) an aliphatic polyisocyanate having from 3 to 12 carbon atoms, or an alicyclic polyisocyanate having from 5 to 25 carbon atoms and (2) a mixed polyester, said mixed polyester being (a) a copolymerization condensation product of, or (b) a separate physical blend of, an aliphatic dicarboxylic acid having from 2 to 12 carbon atoms and an aromatic dicarboxylic acid having from 8 to 12 carbon atoms with (2) a polyol having a molecular weight of 500 or less, the amount of said aliphatic dicarboxylic acid ranging from about 90 percent to about 10 percent by weight, the molecular weight of said polyester made from said acid and said polyol ranging from about 500 to about 4,000, and wherein the equivalent ratio of said isocyanate to the OH end groups in said polyester ranges from about 1.5 to about 3.0;

separately preparing a curing component, said curing component comprising a urethane curing agent and a curing agent solvent the equivalent ratio of said curing agent to said isocyante being from about 0.8 to about 1.2;

separately preparing a cement component, said cement component comprising about 3 to about 7 parts by weight, per 100 parts by weight of said urethane prepolymer, of an epoxy having solvent leaching resistance, and a solvent;

a thixotropic compound, said thixotropic compound located in said curing component, the amount of said thixotropic agent being from about 2 parts by weight to about 8 parts by weight per 100 parts by weight of said urethane prepolymer;

maintaining said cement component separate from said polymer component and said curing agent, and maintaining said polymer component separate from said curing component thereby maintaining stability of each of said components;

the total amount of solids in said overall formulation ranging from about 20 percent to about 60 percent by weight based upon the total amount of said solvents and said solvents in said overall formulation.

4,496,708

WATER-SOLUBLE POLYURETHANE COMB POLYMER PRODUCTION

David C. Dehm, Thornton, Pa.; Kenneth L. Hoy, St. Albans, and Richard C. Hoy, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 14, 1983, Ser. No. 561,472
Int. Cl.³ C08G *18/48*
U.S. Cl. 528—76 **24 Claims**

1. A comb polymer comprising a water-soluble polyurethane containing the repeating units:

$$-X_{a'}-,\ -Y_b-\ \text{and}\ -(-X-)_m-Z_c-$$

wherein:

X is the residue of an organic polyisocyanate;

Y is the residue of a polyethylene glycol homopolymer or copolymer with up to 50 mole percent C_3 to C_5 polyoxyalkylene, or the monomeric equivalent of said polyethylene glycol;

Z is the residue of a hydrophobe reactant containing a monovalent hydrophobic group providing a molar volume contribution of at least about 130 cc/mole;

b is at least about 2;

c is at least about 2;

m is 0 or 1;

a' is such that

$$\frac{a' + mc}{b + c}$$

is between about 0.50 to about 1.25 and sufficient to provide a polymer molecular weight of at least about 10,000; and wherein:

(1) the polymer has at least one Z unit separated from each end of the polymer by at least one X unit; and

(2) the hydrophilic/lipophilic balance of the polymer is between about 14 to about 19.5.

4,496,709

PROCESS FOR PREPARING EPOXY RESINS EMPLOYING A PHOSPHONIUM TRIFLUOROACETATE CATALYST

George A. Doorakian, Bedford; Marsha A. Paul, Natick, both of Mass., and Adolphus V. Gist, Dallas, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 391,094, Jun. 23, 1982, abandoned. This application Jun. 16, 1983, Ser. No. 504,918
Int. Cl.³ C08G *59/68*
U.S. Cl. 528—89 **12 Claims**

1. In a process for advancing epoxy resins in molecular weight by reacting (A) an epoxy resin which is a glycidyl ether of a dihydric phenol having an average of more than one glycidyl ether group per molecule with (B) a dihydric phenolic or thiophenolic compound in the presence of catalytic quantities of (C) a phosphonium catalyst; the improvement which comprises employing as the catalyst, component (C), a phosphonium trifluoroacetate salt.

4,496,710
PROCESS FOR THE PRODUCTION OF FLAT VARNISHES

Fritz Gude, Herne; Herbert Haferkorn; Heinz Riemer, both of Bottrop, and Günter Dörmann, Bochum, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,229

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311404

Int. Cl.³ C08G 59/42

U.S. Cl. 528—114 9 Claims

1. A curing agent for epoxy varnishes, comprising the monosalt reaction product of trimellitic acid and 2-pheny-methyl-Δ2-imidazoline.

4,496,711
PROCESS FOR PREPARING ISOIMIDE CONTAINING OLIGOMERS

Abraham L. Landis, Northridge, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Continuation-in-part of Ser. No. 206,317, Jul. 24, 1981, Pat. No. 4,438,273. This application Sep. 26, 1983, Ser. No. 536,068

Int. Cl.³ C08G 73/10

U.S. Cl. 528—125 32 Claims

1. A process for preparing an isoimide-containing oligomer which comprises:

(a) reacting in a first chosen organic solvent with the addition of heat

(1) the reaction product of

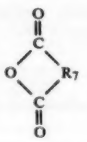
(i) a carboxylic acid dianhydride having the formula,

wherein R is a tetravalent organic group containing 2 to 27 carbon atoms, and

(ii) a diamine having the formula $H_2N—R_5—NH_2$ wherein R_5 is a divalent aryl group containing 2 to 30 carbon atoms; with a compound to enable formation of a polyamic acid and which compound is selected from the group consisting of:

(2) a functional amine having the formula $H_2N—R_1—X$ wherein R_1 is a divalent organic group containing 1 to 20 carbon atoms, and

(3) a monoanhydride having the formula



wherein R_7 is a trivalent aryl group having substituted thereon X, a radical containing an alkenylene group, or a heterocyclic group, and X in (2) and (3) is a radical having an unsaturated functional group capable of undergoing addition polymerization with another radical having an unsaturated functional group;

(b) cooling the resulting first reaction mixture to a selected temperature about at least as low as ambient temperature,

(c) adding to said first reaction mixture at said selected temperature a dehydrating agent to cyclize said polyamic acid by dehydration to thereby form an isoimide-containing oligomer in solution in a second reaction mixture, and which dehydrating agent has the following properties of (1) being readily soluble with a polyamic acid in a common solvent, (2) cyclizing a polyamic acid at reduced temperatures at least as low as ambient temperature, (3) not substantially adversely affecting solubility of any reactants in the presence of the polyamic acid and permitting all of the necessary reactants to remain in solution, (4) not causing generation of a substantial amount of undesirable side-reaction products which are not readily removable and which might or do adversely affect the isoimide oligomer thus produced, and (5) not substantially adversely affecting a polyimide produced therefrom,

(d) mixing the solution of said second reaction mixture with a second selected solvent to produce precipitation of said isoimide-containing oligomer as a solid product; and

(e) separating said solid product from said second selected solvent.

4,496,712
OPTICALLY ANISOTROPIC MELT FORMING COPOLYESTERS

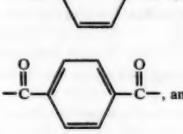
Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1983, Ser. No. 562,116

Int. Cl.³ C08G 63/60

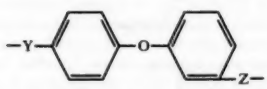
U.S. Cl. 528—191 9 Claims

1. A copolyester consisting essentially of Units I, II and III, said units having the structural formulas:



I

II



III

where X is selected from the group consisting of halo-, lower alkyl, and aryl, Y and Z are independently selected from the group consisting of oxygen and carbonyl; and Units I and II are each present in the amount of from about 30 to 50 mole % and Unit III is present in an amount of from about 5 to 20 mole %.

4,496,713
MOLDING COMPOSITIONS WITH HIGH TOUGHNESS AND HOT-WATER RESISTANCE

Gernot Horlbeck, Haltern, and Klaus Burzin, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels, Marl, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,898

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1982, 3239413

Int. Cl.³ C08G 63/02, 63/18

U.S. Cl. 528—272 20 Claims

1. A copolyester of terephthalic acid or a C_{1-4}-alkyl ester thereof and about 1.25–2 moles of diol component per mole of terephthalic component, wherein the diol component comprises 5–25 molar percent, based on the total diol content of a linear α,ω-alkanediol of 6–20 carbon atoms and 95–75 molar percent of 1,4-butanediol, which copolyester has a viscosity number (J) of >120 cc/g (measured in a solution of 0.23 g of

copolyester in 100 ml of phenol/1,1,2,2-tetrachloroethane (60/40 parts by weight) at 25° C.) and which has a low viscosity drop when exposed to pressurized water at a temperature of 130° C.

4,496,714

POLYESTER, ADHESIVES COMPRISING THE SAME, AND LAMINATES AND LAMINATED HOLLOW VESSELS MADE THEREOF

Yoshifumi Murata; Keishiro Igi, both of Kurashiki; Hiroshi Narukawa, Sojya; Masao Uetsuki, Kurashiki; Satoshi Bando, Kurashiki; Shuji Kawai, Kurashiki, and Kenji Shirano, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

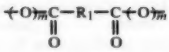
Filed Dec. 15, 1983, Ser. No. 561,838

Claims priority, application Japan, Dec. 21, 1982, 57-225426; Jan. 26, 1983, 58-11924

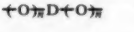
Int. Cl.³ C08G *63/02*

U.S. Cl. 528—272 **9 Claims**

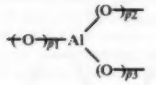
1. A thermoplastic polyester comprising the constituent units represented by the following formulas (I), (II), (III) and (IV):



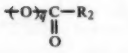
(I)



(II)



(III)



(IV)

wherein R_1, in its repeated occurrence in said polyester, represents one or more divalent groups each derived from a dicarboxylic acid selected from the group consisting of terephthalic acid, isophthalic acid, orthophthalic acid and a straight-chained aliphatic dicarboxylic acid containing 4 to 10 carbon atoms by removal of both carboxyl groups therefrom, R_2, in its repeated occurrence in said polyester, represents one or more monovalent groups each selected from the group consisting of an aliphatic or alicyclic monocarboxylic acid containing 6 to 30 carbon atoms and an aromatic monocarboxylic acid containing 7–20 carbon atoms by removal of the carboxyl group therefrom, D, in its repeated occurrence in said polyester, represents one or more divalent groups each derived from a diol selected from the group consisting of an aliphatic diol containing 2 to 10 carbon atoms and an alicyclic diol containing 6 to 8 carbon atoms by removal of both hydroxyl groups therefrom, and m, n, p_1, p_2, p_3 and q are each an integer of 0 or 1, said constituent units being bonded together in the combinations of (I)-(II), (I)-(III), (II)-(III), (II)-(IV), (III)-(III) and (III)-(IV) and via only one oxygen atom in each combination, the molar ratio (I):(II) being substantially 1:1, the molar ratio (I):(III) being in the range of 1,000:1 to 100:5 and the molar ratio (III):(IV) being in the range of 4:1 to 1:10, said polyester having an intrinsic viscosity of not less than 0.5 dl/g.

4,496,715

AMIDE-IMIDE-ESTER WIRE ENAMELS

Frank A. Sattler, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 292,244, Sep. 25, 1972, abandoned, which is a continuation of Ser. No. 61,105, Aug. 5, 1970, abandoned, which is a continuation of Ser. No. 555,211, Mar. 4, 1975, abandoned, said Ser. No. 61,105, Division of Ser. No. 730,833. This application Oct. 29, 1979, Ser. No. 88,733

Int. Cl.³ C08G *63/12*

U.S. Cl. 528—288 **5 Claims**

1. A polymeric amide-imide-ester coating composition of (1) trimellitic anhydride, (2) an aromatic carbocyclic primary diamino compound and (3) a polyol containing at least 3 hydroxy groups, wherein the molar proportion of (1):(2) for the amide-imide linkages is from 0.8:1 to 1.8:1, said composition being soluble in cresol, cresylic acid and phenol.

4,496,716

DRAW-TEXTURED, BASE-DYEABLE POLYESTER YARN

Remy Humbrecht, Reussbuhl, and Heinrich Schmieder, Emmenbrucke, both of Switzerland, assignors to Viscosuisse S.A., Emmenbrucke, Switzerland

PCT No. PCT/CH83/00035, § 371 Date Nov. 29, 1983, § 102(e) Date Nov. 29, 1983, PCT Pub. No. WO83/03432, PCT Pub. Date Oct. 13, 1983

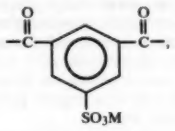
PCT Filed Mar. 16, 1983, Ser. No. 556,247

Claims priority, application Switzerland, Mar. 30, 1982, 1935/82

Int. Cl.³ C08G *63/66, 63/68*

U.S. Cl. 528—295 **15 Claims**

1. Thread with a proportion of a basic-dyeable, texturised polyester filament, characterised in that the basic-dyeable polyester filament contains a metal sulphonate containing the structural unit



where M is equal to Na or K and a compound A containing the structural units $-(CH_2)_y-$ and/or $-O-(C_{x_1}H_{2x_1}O)_{y_1}-$ where $x_1 \geqq 2$, $y \geqq 20$ and $x_1 y_1 \geqq 20$.

4,496,717

ERYTHROMYCIN B DERIVATIVES

Takashi Adachi, Kuki; Shigeo Morimoto, Saitama; Yoko Takahashi, Ageo; Yoshiaki Watanabe, Kodaira, and Sadafumi Omura, Ageo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

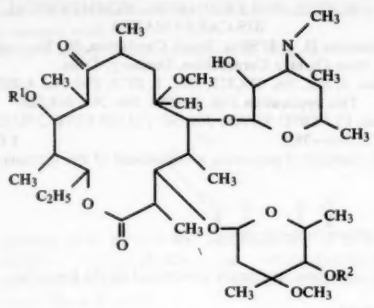
Filed Nov. 24, 1982, Ser. No. 444,170

Claims priority, application Japan, Dec. 1, 1981, 56-193444

Int. Cl.³ C07H *17/08*

U.S. Cl. 536—7.2 **4 Claims**

1. An erythromycin B derivative of the formula



wherein R^1 and R^2 are the same or different and are each hydrogen or methyl, and the pharmaceutically acceptable acid addition salts thereof.

4,496,718

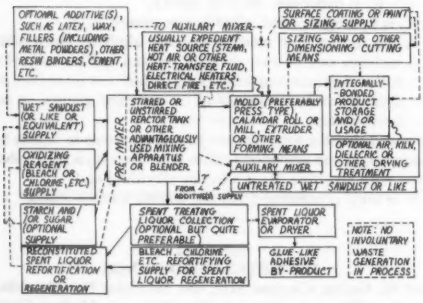
INTEGRALLY BONDED COMPOSITIONS OF CELLULOSICS AND PRODUCTS THEREOF DIRECTLY FROM WET SAWDUST AND THE LIKE

N. Jerome Rudy, 3613 Orchard Dr., P.O. Box 1391, Midland, Mich. 48641

Continuation-in-part of Ser. No. 212,110, is a continuation-in-part of Ser. No. 90,829, Nov. 1, 1979, abandoned. This application Jul. 16, 1982, Ser. No. 399,681

Int. Cl.³ C08B *15/00, 15/10*

U.S. Cl. 536—56 **97 Claims**


OPTIONAL ADDITIVE(S), SUCH AS LATEX, WAX, FILLERS (INCLUDING METAL POWDERS), OTHER RESIN BINDERS, CEMENT, ETC.
TO AUXILIARY MIXER
USUALLY EXPEDIENT HEAT SOURCE (STEAM, HOT AIR, OR OTHER HEAT-TRANSFER FLUID, ELECTRICAL HEATERS, DIRECT FIRE, ETC.)
SURFACE COATING OR PAINT OR SIZING SUPPLY
SIZING SAW OR OTHER DIMENSIONING CUTTING MEANS
"WET" SAWDUST (OR LIKE OR EQUIVALENT) SUPPLY
STIRRED OR UNSTIRRED REACTOR TANK OR OTHER ADVANTAGEOUSLY USED MIXING APPARATUS OR BLENDER
PRE-MIXER
MOLD (PREFERABLY PRESS TYPE), CALENDAR ROLL OR MILL, EXTRUDER OR OTHER FORMING MEANS
INTEGRALLY-BONDED PRODUCT STORAGE AND/OR USAGE
OPTIONAL AIR, KILN, DIELECTRIC OR OTHER DRYING-TREATMENT
OXIDIZING REAGENT (BLEACH OR CHLORINE, ETC.) SUPPLY
AUXILIARY MIXER
FROM ADDITIVES SUPPLY
UNTREATED "WET" SAWDUST OR LIKE
STARCH AND/OR SUGAR (OPTIONAL) SUPPLY
SPENT TREATING LIQUOR COLLECTION (OPTIONAL BUT QUITE PREFERABLE)
SPENT LIQUOR EVAPORATOR OR DRYER
NOTE: NO INVOLUNTARY WASTE GENERATION IN PROCESS
RECONSTITUTED SPENT LIQUOR REFORTIFICATION OR REGENERATION
BLEACH, CHLORINE, ETC. REFORTIFYING SUPPLY FOR SPENT LIQUOR REGENERATION
GLUE-LIKE ADHESIVE BY-PRODUCT

1. A fabrication composition comprising, in admixture:

(a) a major proportion of an at least substantially undried, particulated, fibrous plant cellulosic material including, in particular, "wet" sawdust; plus

(b) an effective quantity for reactive conversion and at least partial water-solubilization of at least a portion of said cellulosic material (a) of a strong, non-azotizing oxidizing reagent capable of destructive attack upon said cellulosic material, which oxidizing reagent is selected from the Group consisting of, nascent-oxidation-reactant forming chlorine-releasing, bromine-releasing, oxygen-releasing and -providing materials, chlorine, bromine and mixtures thereof.

4,496,719

3H-INDOL-2-YL CATIONIC HYDRAZONE DYESTUFFS

Roderich Raue, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

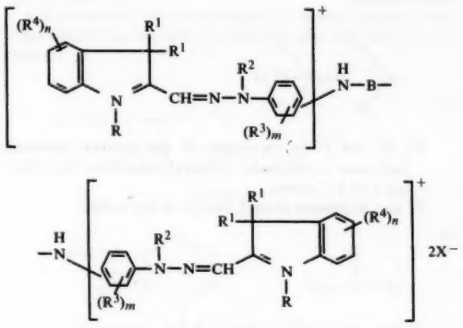
Filed Feb. 15, 1983, Ser. No. 466,709

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207477

Int. Cl.³ C07D *209/12, 403/12*

U.S. Cl. 548—455 **5 Claims**

1. A cationic hydrazone dyestuff of the general formula



in which

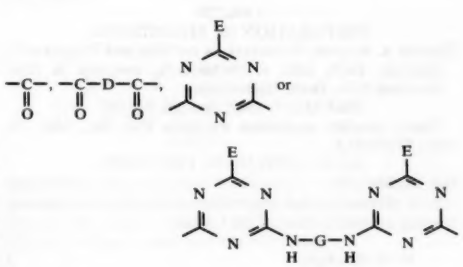
R represents an alkyl radical which has 1 to 4 C atoms and is optionally substituted by hydroxyl, alkoxy having 1 to 4 C atoms, acetyloxy, propionyloxy, benzoyloxy, carbamoyloxy, halogen, cyano, carboxyl, C_1- to C_4-carbalkoxy, carboxamido or acetyl,

R^1 represents an alkyl radical which has 1 to 4 C atoms and the two radicals can also form a closed ring,

R^2 represents analkyl radical which has 1 to 4 C atoms and which can be substituted by hydroxyl,

R^3 represents an alkyl radical having 1 to 4 C atoms, an alkoxy radical having 1 to 4 C atoms or halogen,

R^4 represents an alkyl radical having 1 to 4 C atoms, halogen, alkoxy having 1 to 4 C atoms, phenoxy, benzyloxy, benzyl, carboxyl, an alkyl carboxylate having 1 to 4 C atoms, a carboxamide group which is optionally substituted by 1 or 2 C_1- to C_4-alkyl radicals, a sulphonamide group which is optionally substituted by 1 or 2 C_1- to C_4-alkyl radicals, alkylsulphonyl having 1 to 4 C atoms, phenylsulphonyl or a cyano, nitro, trifluoromethyl, acetyl or benzoyl group, B corresponds to a radical of the formulae



in which

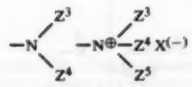
D represents an alkylene radical having 2 to 6 C atoms or a phenylene or a naphthylene radical,

E represents halogen, hydroxyl, alkoxy having 1-4 C atoms or the radical

Z and Z^1 independently of each other represent hydrogen or the radical —Y—Z^2,

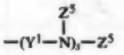
Y represents alkylene having 1 to 6 C atoms,

Z^2 represents hydrogen, hydroxyl, pyridinium or the radicals



Z^3, Z^4 and Z^5 independently of one another represent hydrogen or optionally hydroxyl-substituted alkyl having 1 to 4 C atoms,

Z^3 also represents phenyl, benzyl or the radical

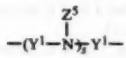


Y^1 represents alkylene having 2–4 C atoms and

s represents 1–8, or

Z and Z^1 as well as Z^3 and Z^4, together with their N atom, may form the pyrrolidino, morpholino, piperidino or piperazino radicals which can be substituted by C_1- to C_4-alkyl or amino-C_1- to C_4-alkyl,

G represents an alkylene radical having 2 to 6 C atoms, a phenylene radical or a radical of the formula



m and n represent 0, 1 or 2 and

$X^{(-)}$ represents an anion.

4,496,720

PREPARATION OF THIOETHERS

Cornelis A. Bruynes, Koudekerk an der Rijn, and Theodorus K. Jurriens, Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Mar. 7, 1983, Ser. No. 472,667

Claims priority, application European Pat. Off., Mar. 11, 1982, 82200327.3

Int. Cl.[3] **C07D** *501/04*; **C07C** *149/30*

U.S. Cl. 544—29 **10 Claims**

1. A process for the preparation of thioethers comprising reacting a silylated thiol of the formula

$$R—S—SiR_1R_2R_3 \qquad I$$

wherein R is an organic group and R_1, R_2 and R_3 are individually selected from the group consisting of alkyl of 1 to 4 carbon atoms with an organic chloride, bromide, iodide, sulfate or sulfonate in the presence of hexamethylphosphoric triamide as a solvent or co-solvent.

4,496,721

PROCESS FOR PREPARING SYMMETRICAL BIS-CARBAMATES

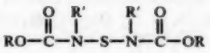
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 636,373, Dec. 1, 1975, Pat. No. 4,382,957. This application Feb. 7, 1983, Ser. No. 464,565

Int. Cl.[3] **C07C** *93/100, 102/00, 161/00*; **C07D** *279/10*

U.S. Cl. 544—58.2 **1 Claim**

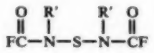
1. A method of preparing a compound of the formula:



which comprises reacting a compound of the formula:

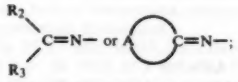
ROH

with a compound of the formula:



in the presence of an acid acceptor, wherein:

R is:



wherein:

R_2 is alkyl, alkylthio, alkoxy, alkanoyl or alkoxycarbonyl, all of which may be unsubstituted or aliphatically substituted in any combination with one or more cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy or R_4R_5—NCO— groups; or R_2 is phenyl, R_4R_5NCO— or R_6CON(R_4)—;

wherein:

R_4 and R_5 are individually hydrogen or alkyl;

R_6 is hydrogen, alkyl or alkoxy;

R_3 is hydrogen, alkyl, alkylthio or cyano;

A is a four or five member divalent aliphatic chain which includes one or two divalent oxygen, sulfur, sulfinyl or sulfonyl groups and which may include not more than one divalent amino, alkylamino or carbonyl groups, in any combination;

provided that the total number of carbon atoms in R may not exceed eight and provided further that when R_2 is alkyl substituted with alkylthio, R_3 is alkyl or alkylthio; and

R′ is alkyl containing from one to four carbon atoms.

4,496,722

REPORTER COMPOUNDS

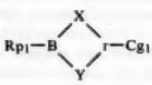
Paul M. Gallop, Chestnut Hill, and Mercedes Paz, Brookline, both of Mass., assignors to The Children's Medical Center Corporation, Cambridge, Mass.

Filed May 1, 1981, Ser. No. 259,705

Int. Cl.[3] **C09D** *5/04*

U.S. Cl. 544—69 **4 Claims**

1. A compound of the formula



wherein

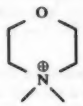
Rp_1 is a group which includes a reporter group chosen from

the group consisting of a fluorophore or a chromophore and which is capable of being bonded to the boron atom of a boronic acid,

each of X and Y, independently, is O, NR_6, or

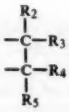
wherein each R_6 and R_7, independently, is H, $-CH_2COO^-$, $-CH_2CH_2SO_3^-$, or $-CH_2CH_2CH_2SO_3^-$, provided that one of x or y is O and provided that at least one of R_6 or R_7 is H;

forms the heterocyclic ring structure

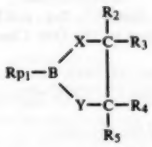


Cg_1 is a carrier group which includes a solubilizing group which is ionized in water, and r is a receptor group which, with X and Y, forms complexes with boronic acids,

said r-Cg_1 being



so that said compound has the formula



wherein each R_2–R_5, independently is selected from H, or one of $-CH_3$, $^-CH_2-COO^-$, and $^-CH_2SO_3^-$,

provided that the compound contains at least one solubilizing group, said solubilizing group being a sulfonate group, a carboxylate group, a quaternary ammonium group as indicated above a guanidinium group, or a phosphate group.

4,496,723

PROCESS FOR THE PREPARATION OF 7-AMINO-1-DETHIA-1-OXA-3-HYDROXYMETHYL-CEPHEM-4-CARBOXYLIC ACIDS

Dieter Hoppe, and Heinz-Werner Kleemann, both of Goettingen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

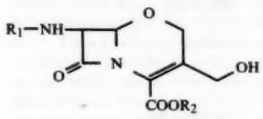
Filed Jun. 20, 1983, Ser. No. 506,731

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225269

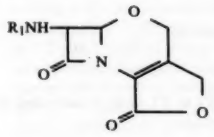
Int. Cl.³ C07D *498/04*

U.S. Cl. 544—90 **5 Claims**

1. A process for the preparation of a 7-amino-1-dethia-1-oxa-3-hydroxymethyl-cephem-4-carboxylic acid derivative of the formula

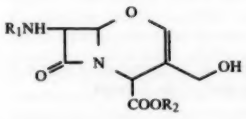


(I)



(II)

or



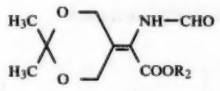
(III)

in which

R_1 is hydrogen or the acyl radical of an organic carboxylic acid or an optionally substituted protective group Z and

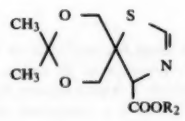
R_2 is a carboxyl protective group or a pharmaceutically acceptable ester radical, which comprises

(a) (i) reacting a compound of the formula



(IV)

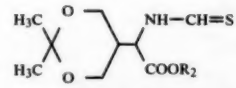
with a sulphurization agent thereby to produce a compound of the formula



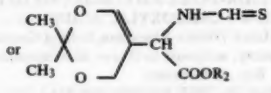
(V)

and reacting the compound of formula (V) with a strong base in a solvent at a low temperature and then with an R_3-containing alkylating agent,

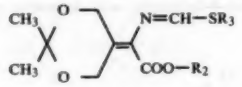
(ii) or reacting a compound of the formula

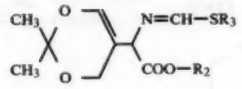


(IV')


(IV'')

with an alkylating agent, thereby to produce a compound of the formula, these compounds are then


(VI)


(VI')

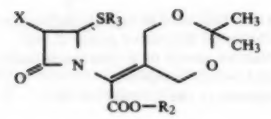
or

(b) reacting the compound VI or VI' with an activated derivative of an acid of the formula

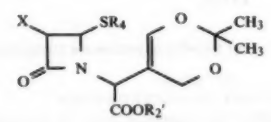
(VII)

in which

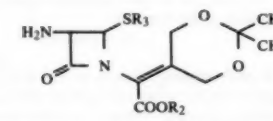
X is azido or phthalimido, in the presence of a base, in a solvent, to give a compound of the formula


(VIII)

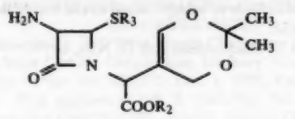
or a double bond isomer thereof of the formula


(VIII')

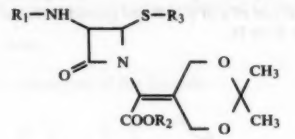
(c) (i) in the case in which X is azido reacting VIII or VIII' with a reducing agent in the presence of an amine, in a solvent, or (ii) in the case in which X is phthalimido, with a phthalimide-cleaving reagent, to give a compound of the formula


(IX)

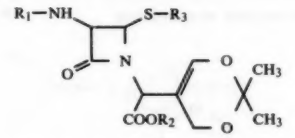
or a double bond isomer thereof of the formula


(IX')

(d) reacting IX or IX' with (i) a carboxyl-activated carboxylic acid R_1'—COOH in which R_1' is an organic radical or with (ii) a reagent which is capable of introducing the optionally substituted Z protective group, to give a compound of the formula



or a double bond isomer thereof of the formula


(X')

(e) and reacting the compound of the formula (X) or (X') with a chlorinating agent in a solvent which is inert to chlorination, and then with a protic acid or with a Lewis acid.

4,496,724

CONTROLLED RELEASE PESTICIDES

Charles L. McCormick, 2308 Clayton Pl., and Kenneth W. Anderson, 3406 Campbell Dr., both of Hattiesburg, Miss. 39401

Filed Dec. 22, 1982, Ser. No. 452,385
Int. Cl.³ C07D *253/06*
U.S. Cl. 544—182 **3 Claims**

1. A method of preparing a pesticide derivative useful in the preparation of controlled release pesticide-polymers which comprise treating a pesticide having an amino group with phosgene at a temperature of about 40° C. to about 55° C. to form a chloroformamide derivative of the pesticide.

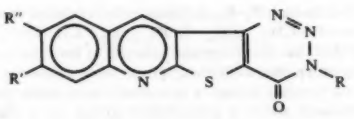
4,496,725

SUBSTITUTED 1,2,3-TRIAZINO[4',5':4,5]-THIENO[2,3-b]QUINOLIN-4(3H)-ONES

James R. McCarthy, Zionsville, Ind., and Paul J. Widner, Landenberg, Pa., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1983, Ser. No. 496,800
Int. Cl.³ C07D *495/12*
U.S. Cl. 544—184 **2 Claims**

1. A compound of the formula



wherein R is hydrogen or alkyl of 1–4 carbon atoms; R′ and R″ are selected from hydrogen and methoxy with the proviso that only one of them can be hydrogen, or R′ and R″ are combined to give methylenedioxy.

4,496,726

POLYTRIAZINYL ALCOHOLS, ESTERS AND URETHANES, A PROCESS FOR THEIR PREPARATION

Hartmut Wiezer, and Gerhard Pfahler, both of Hoechst Aktiengesellschaft, D-6230, Frankfurt am Main 80, Fed. Rep. of Germany

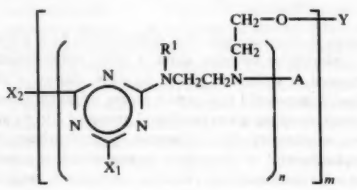
Filed Aug. 2, 1982, Ser. No. 404,500

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131684

Int. Cl.³ C07D *401/12*

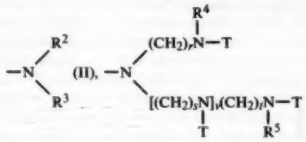
U.S. Cl. 544—198 **3 Claims**

1. A polytriazinyl compound of the formula (I)



(I)

in which n is an integer from 1 to 100 and m is an integer from 1 to 20, X_1 represents halogen, phenyl or a group of the formula (II), (III) or (IV)

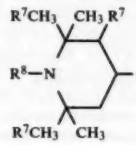


(II),

(III)

(IV)

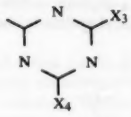
in which formulae R^2 is hydrogen, C_1- to C_{18}-alkyl, C_5- to C_{12}-cycloalkyl which can be substituted by a C_1- to C_4-alkyl group, C_3- to C_{12}-alkenyl, or phenyl which can be substituted by one or two Cl atoms or by one or two C_1- to C_4-alkyl groups or by C_1- to C_4-alkoxy or C_1- to C_2-carboalkoxy, or C_7- to C_{14}-phenylalkyl or a group of the formula (V)



(V)

in which R^7=hydrogen or methyl and R^8=hydrogen, C_1- to C_4-alkyl which can be substituted by one OH group or, in the case of C_3-alkyl, can also be substituted by two OH groups, 2,3-epoxypropyl, allyl or benzyl; R^3 is identical with or different from R^2 and has the meanings indicated under R^2 and additionally represents C_3- to C_{21}-alkoxyalkyl or dimethylamino-C_2- to C_5-alkyl or diethylamino-C_2- to C_5-alkyl

or, together with the N atom linking them, R^2 and R^3 represent a pyrrolidine ring or a piperidine, morpholine or hexamethyleneimine ring which is unsubstituted or substituted by up to four C_1- to C_4-alkyl groups; r, s and t represent identical or different integers from 2 to 6 and v represents an integer from 0 to 3; R^4 and R^5 are identical or different radicals having the meanings indicated under R^2 and T is a group of the formula (VI)



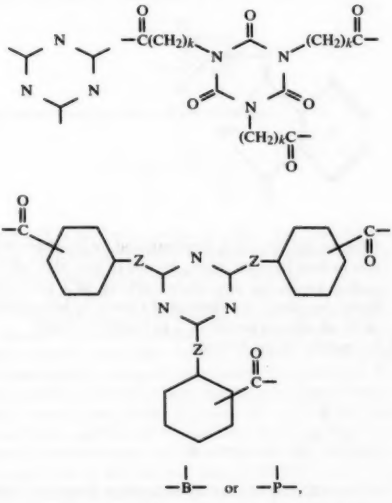
(VI)

in which X_3 and X_4 are identical or different radicals of the formulae (II), (III) or (IV) and R^6 represents one of the radicals listed under R^2; R^1 has the meaning of one of the radicals listed under R^2; X_2 represents one of the groups indicated under X_1, A is a group of the formula (VI) and,

if m=1, Y is a C_1- to C_{18}-aliphatic acyl group which can be substituted by —OH or —Cl, a C_5- to C_{12}-alicyclic acyl radical which can be substituted by —OH or C_1- to C_4-alkyl, a C_6- or C_{10}-aromatic acyl or sulfonyl radical which can be substituted by —OH, C_1- to C_4-alkoxy, halogen or —NH_2, a C_7- to C_{16}-araliphatic acyl radical which can be substituted by —OH and/or 1 or 2 C_1- to C_4-alkyl groups, or a C_1- to C_{18}-alkyl group, a C_5- to C_{12}-cycloalkyl group or a phenylcarbamoyl or naphthylcarbamoyl group which can be substituted by halogen or by C_1- to C_4-alkyl,

if m=2, Y represents a C_2- to C_{18}-aliphatic radical which can be substituted by up to two OH groups, a C_3- to C_{12}-alicyclic radical which can be substituted by C_1- to C_4-alkyl, a phenyl, naphthyl or C_7- to C_{16}-araliphatic diacyl radical which can be substituted by —Cl or C_1- to C_4-alkyl, or a C_2- to C_{12}-aliphatic α,ω-dicarbamoyl group, or a phenylenedicarbamoyl group which can be substituted by C_1- to C_4-alkyl or chlorine, or a C_7- to C_{18}-araliphatic dicarbamoyl group which can be substituted by up to four C_1- to C_4-alkyl groups,

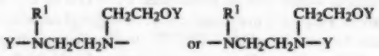
if m=3, Y represents a C_2- to C_5-aliphatic or C_6-aromatic triacyl radical which can be substituted by up to two OH groups, or represents groups of the formulae



in which k is an integer from 1 to 6 and Z denotes —O— or

if m=4, Y is a C_4- to C_6-aliphatic tetraacyl radical or a C_6- to C_{10}-aromatic tetraacyl radical or the group

if m=5 or 6, Y represents a C_5- to C_8-aliphatic or cycloaliphatic radical or, if m>3, represents an oligomeric acyl radical which is derived from acrylic acid or derivatives thereof, if n>1 and m=1, X_2 as a terminal group is halogen or one of the radicals



in which R^1 and Y have the meanings indicated above, A as a terminal group is H or Y, and at least one radical of the formula (V) must be present in formula (I).

4,496,727

PROCESS FOR THE MANUFACTURE OF METAL COMPLEXES OF ISOINDOLINE AZINES

Abul Iqbal, Ettingen, and Paul Lienhard, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

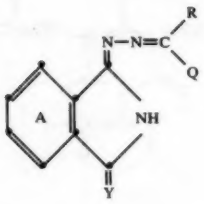
Division of Ser. No. 242,005, Mar. 9, 1981, Pat. No. 4,385,174. This application Sep. 24, 1982, Ser. No. 423,353

Claims priority, application Switzerland, Mar. 13, 1980, 1976/80

Int. Cl.³ C07F *1/08, 3/00, 15/00*

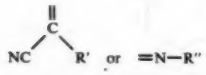
U.S. Cl. 544—225 **9 Claims**

1. A process for the manufacture of a 1:1 metal complex of an azine of the formula

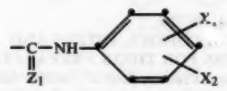


wherein the ring A is unsubstituted or is substituted by two to four halogen atoms, by one or two alkyl of 1 to 4 carbon atoms, by one or two alkoxy of 1 to 4 carbon atoms, by phenyl, by phenoxy, by nitro, by benzoylamino, or by an alkanoylamino of 2 to 6 carbon atoms,

Y is a radical of the formula

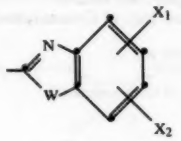


wherein R′ is an alkoxycarbonyl, alkylcarbamoyl, carbamoyl, thiocarbamoyl or sulfamoyl group, a benzylcarbamoyl group, a phenylsulfamoyl or phenylsulfonyl group which is unsubstituted or substituted by halogen atoms or alkyl groups of 1 to 4 carbon atoms, a group of the formula



(9)

or

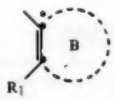


(10)

wherein Z_1 is an oxygen or a sulfur atom, X_1 is a hydrogen, chlorine or bromine atom, a nitro, trifluoromethyl, carbamoyl or sulfamoyl group, an alkyl, alkoxy or alkylsulfamoyl group of 1 to 4 carbon atoms, an alkanoylamino, alkylcarbamoyl or alkoxycarbonyl group of 2 to 6 carbon atoms, a phenoxy, benzoylamino, phenylcarbamoyl or phenylsulfamoyl or phenylazo group which is unsubstituted or substituted by chlorine or bromine atoms or methyl groups, and X_2 is a hydrogen, chlorine or bromine atom, an alkyl or alkoxy group of 1 to 4 carbon atoms, W is O, S, or NH, and R″ is a radical of the formula (10),

R is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or naphthyl,

Q is a group of formula (2)

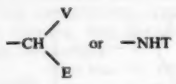


(2)

wherein R_1 is a hydroxyl or mercapto group and B is an isocyclic or heterocyclic radical selected from the group consisting of phenylene, naphthylene, a 5- or 6-membered heterocyclic ring which may be fused with a benzene nuclei and which contains a nitrogen, oxygen or sulfur atom β-oriented to the C* atom and which may contain a further nitrogen atom in the ring and a fused benzene ring or a further heterocyclic ring, which 5- or 6-membered heterocyclic ring is selected from the group consisting of 2,4-dihydroxyquinoline, 2,4-dihydroxy-5,6,7 or 8-chloroquinoline, 2,4-dihydroxy-6,8- or 7,8-dichloroquinoline, 2,4-dihydroxy-6,7 or 8-methylquinoline, 2,4-dihydroxy-6-chloro-8-methylquinoline, 2-methyl-4-hydroxyquinoline, 2-methyl-4-hydroxy-6-chloroquinoline, 2-methyl-4-hydroxy-6-methoxyquinoline, 3-hydroxyisoquinoline, barbituric acid, 2-methyl-4,6-dihydroxypyrimidine, 4-hydroxycoumarin, 4-hydroxy-6-methylcoumarin, 4-hydroxy-6-methoxycoumarin, 4-hydroxy-6-chlorocoumarin, 4-hydroxy-6-chloro-5,7-dimethylcoumarin, 1-phenyl-3-methylpyrazol-5-one, 1-phenyl-3-carboxypyrazol-5-one, 1-phenyl-3-carbamoylpyrazol-5-one, 1-phenyl-3-methoxycarbonylpyrazol-5-one, 1-phenyl-3-ethoxycarbonylpyrazol-5-one, 1-o-chlorophenyl-3-methylpyrazol-5-one, 1-p-chlorophenyl-3-methylpyrazol-5-one, 1-o-methylphenyl-3-methylpyrazol-5-one, and 1-p-methylphenyl-3-methylpyrazol-5-one,

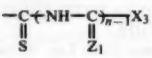
or

Q is a radical of the formula

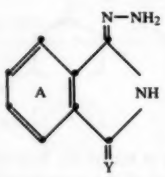


wherein E is an acyl group, an unsubstituted or a substituted carbamoyl or thiocarbamoyl group, V is an acyl, cyano or nitro group or an unsubstituted or substituted carbamoyl or thiocarbamoyl group, T is

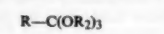
the radical of a heteroaryl amine selected from the group consisting of 2-aminothiophene, 2-aminothiazole, 2-amino-5-nitrothiazole, 2-amino-5-methylsulfonylthiazole, 2-amino-5-cyanothiazole, 2-amino-4-methyl-5-nitrothiazole, 2-amino-4-methylthiazole, 2-amino-4-phenylthiazole, 2-amino-4-(4'-chloro)-phenylthiazole, 2-amino-4-(4'-nitro)-phenylthiazole, 2-aminopyrazole, 3-amino-1-phenylpyrazole, 3-aminoindazole, 5-methylsulfonyl-2-aminothiazole, 5-benzoyl-2-aminothiazole, 2-aminoimidazole, 4,5-dicyano-2-aminoimidazole, 4,5-diphenyl-2-aminothiazole, 2-amino-3,4-thiadiazole, 2-amino-3,5-thiadiazole, 3-amino-1,2,4-triazole, 2-amino-3,4-oxadiazole, 3-aminopyridine, 2-aminopyridine-N-oxide, 2-amino-benzthiazole, 2-amino-6-chlorobenzthiazole, 2-amino-6-methyl-benzthiazole, 2-amino-6-methoxy-benzthiazole, 2-amino-6-chloro-4-nitrobenzthiazole, 2-amino-6-bromo-4-cyanobenzthiazole, 2-amino-6-cyano-4-methylbenzthiazole, 2-amino-6-methyl-4-nitrobenzthiazole, 2-amino-6-methoxy-4-nitrobenzthiazole, 2-amino-6-butoxy-4-chlorobenzthiazole, 2-amino-4-chloro-5-methoxy-benzthiazole, 2-amino-4-bromo-6-methoxybenzthiazole, 2-amino-4,6-dichlorobenzthiazole, 2-amino-4,6-dibromobenzthiazole, 2-amino-4-methyl-6-(trifluoromethyl)-benzthiazole, 2-amino-4-methyl-6-propionyl-benzthiazole, 2-amino-4-chloro-6-methylsulfonyl-benzthiazole, 3-amino-benzisothiazole, 3-amino-5-chlorobenzisothiazole, 2-amino-3-cyanotetrahydrobenzthiophene, 2-amino-benzimidazole, 2-amino-6-chlorobenzimidazole, 2-amino-6-bromo-benzimidazole, 2-amino-6-methyl-benzimidazole, 2-amino-6-methoxybenzimidazole, 2-amino-6-ethoxy-benzimidazole, 2-amino-6-methylsulfonyl-benzimidazole, 2-amino-6-acetylaminobenzimidazole, 3-amino-isoindoleninone-1, 1,4-diaminophthalazine and 1-amino-4-chlorophthalazine, as well as their imine forms, or T is a radical of the formula



wherein Z_1 is an oxygen or a sulfur atom, n is 1 or 2, X_3 is an alkyl, cycloalkyl, aralkyl or aryl radical, or an amino group which is unsubstituted or substituted by an alkyl, cycloalkyl, aralkyl or aryl radical, and the metal is selected from the group consisting of zinc, cadmium, manganese, conbalt, iron, copper and nickel, which comprises condensing a hydrazone of the formula

 (5)

with an ortho ester of formula

 (6)

where A, Y and R are defined above and R_2 is alkyl of 1 to 4 carbon atoms, benzyl or phenyl,

then reacting the product of the condensation of the hydrazone of formula (5) and the ortho ester of formula (6) with a compound of formula

where Q is defined above, in the presence of a metal salt selected from the group consisting of the formates, acetates and stearates of zinc, cadmium, manganese, cobalt, iron, copper and nickel, at a temperature of 100°–200° C. in a polar organic solvent.

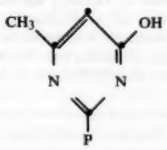
4,496,728

METHOD FOR THE PRODUCTION OF 2-ISOPROPYL-4-METHYL-6-HYDROXYPYRIMIDINE

Joseph T. Blackwell, III, Denham Springs, La., and Larry Gasper, III, Greensboro, N.C., assignors to Ciba-Geigy Corporation, New York, N.Y.

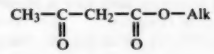
Filed Sep. 20, 1982, Ser. No. 419,842
Int. Cl.³ C07D *239/36*
U.S. Cl. 544—319 **8 Claims**

1. A process for preparing an oxypyrimidine-type compound of the formula:



where P is selected from the group consisting of isopropyl, cyclopropyl and n-propyl-, which comprises the steps of reacting an amidine hydrochloride of the formula:

with an acetoacetic ester of the formula:



where Alk is methyl or ethyl, to effect ring closure by introducing an alkali-neutralized methanolic solution of said amidine hydrochloride to a temperature range of −5° C. to 15° C. together with said acetoacetic ester into the first stage of a multi-stage reactor, this multi-stage reactor comprising a series of chambers (stages) connected by restricted flow orifices to ensure limited dwell time for the reactants at each stage but preventing back mixing of the incoming raw materials, flowing said mixture of reactants into the second stage of said multi-stage reactor away from the zone of reactant introduction; adjusting the pH in said second stage to 12.0±1 with caustic solution to initiate said ring closure reaction while maintaining a temperature in said second stage at 40°±5° C.; flowing said reaction mixture maintained at said temperature and pH to at least one successive stage; holding said reaction mixture of each of said successive stages for at least 2–8 minutes until the ring closure reaction at the last stage is complete.

4,496,729
CATALYSTS FOR THE PRODUCTION OF 2-CYANOPYRAZINE

Wolfgang Bergstein, Rodenbach; Heinz Friedrich, Hanau; Axel Kleemann, Hanau; Günther Prescher, Hanau, and Helmut Beschke, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 351,404, Feb. 23, 1982, Pat. No. 4,419,272. This application Jul. 7, 1983, Ser. No. 511,574

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107756

Int. Cl.³ C07D *241/24*

U.S. Cl. 544—336 **15 Claims**

1. A process for the preparation of 2-cyanopyrazine comprising heat reacting 2-methylpyrazine with ammonia and oxygen in the presence of a catalyst consisting essentially of the elements antimony, vanadium and oxygen and additionally at least one of the elements iron, copper, titanium, cobalt, manganese, and nickel where the atomic ratio of antimony to vanadium is greater than 1 and which contains in addition to these compounds a lattice layer silicate and highly dispersed silica and which has a BET surface area of 5 to 50 m^2/g, a macropore volume of 0.1 to 0.8 cm^3/g, and an average pore radius of 1 to 8×10^{-7} cm.

4,496,730
PHOSPHOROUS DIKETONATE ELECTRON ACCEPTING RING COMPOUNDS AS SENSITIZERS FOR ELECTRON DONATING PHOTOCONDUCTIVE COMPOSITIONS

Chin H. Chen; Thomas E. Goliber; Jerome H. Perlstein, and George A. Reynolds, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 20, 1982, Ser. No. 420,461

Int. Cl.³ C07F *9/21, 9/58*

U.S. Cl. 546—23 **7 Claims**

1. A method of making a tellurium-free dye having a tetrafluorophosphorous diketonate component comprising the step of reacting in stoichiometric amounts, an m-alkyl substituted tetrafluorophosphorous diketonate with an aldehyde.

4. A dye comprising a methine linking group linked to a tellurium-free tetrafluorophosphate diketonate component.

4,496,731
PROCESS FOR THE PREPARATION OF PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID N,N'-DIALKYLDIIMIDE PIGMENTS

Ernst Spietschka, Idstein, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

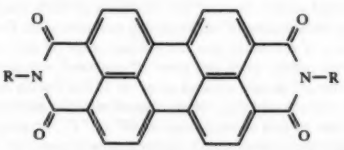
Filed Feb. 24, 1983, Ser. No. 469,222

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208192

Int. Cl.³ C07D *471/06;* C09B *5/62*

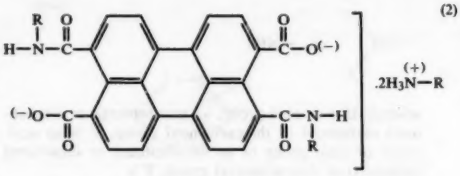
U.S. Cl. 546—37 **10 Claims**

1. A process for the preparation of a perylene-3,4,9,10-tetracarboxylix acid N,N' dialkyldiimide of the formula



(1)

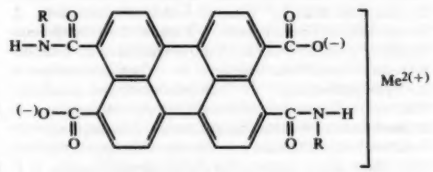
in which R is lower alkyl, from the compound of the formula



(2)

said compound of the formula (2) having been derived from the corresponding perylene-3,4,9,10-tetracarboxylic anhydride and about 4 to 10 moles, per moie of said anhydride of an alkyl amine of the formula $R\text{-}NH_2$, R being lower alkyl, said process comprising the steps of:

reacting with each mole of said compound of formula (2) at least two moles of a water soluble inorganic chloride or nitrate salt of at least one of the divalent metals Ca, Ba, Sr, or Zn or of divalent iron in aqueous medium in order to form a sparingly soluble salt of the formula



(3)

in which Me is a said divalent metal or the divalent iron, and subjecting said salt of fomula (3) to a

cyclization reaction at a temperature of from 20° to 150° C. and washing to remove the soluble inorganic anion.

4,496,732
STEREOSELECTIVE REDUCTION OF 2- OR 3-SUBSTITUTED 4-PIPERIDONES WITH SODIUM BOROHYDRIDE

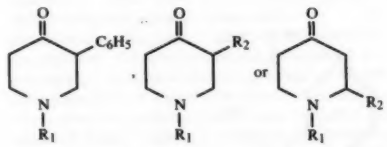
George E. Lee, Somerville, and Thomas B. K. Lee, Whitehouse Station, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Mar. 14, 1983, Ser. No. 474,856

Int. Cl.³ C07D *211/46*

U.S. Cl. 546—216 **20 Claims**

1. A process for a stereoselective reduction of a 4-piperidone compound of the formula,



where R_1 is hydrogen, loweralkyl or benzyl and R_2 is methyl or ethyl, to a di-equatorial isomer of the corresponding 4-piperidinol, wherein said reduction is conducted by use of sodium borohydride at a temperature substantially lower than ambient temperature in a protic solvent medium in the presence of an inorganic acid or acidic salt thereof.

4,496,733

PROCEDURE FOR PRODUCING 2-AMINOPYRIDINES FROM 2-PYRIDINE CARBOXYLIC ACID-N-OXIDES

Daniel Quarroz, Visp, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

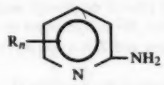
Filed Mar. 30, 1983, Ser. No. 480,314

Claims priority, application Switzerland, Mar. 31, 1982, 1979/82

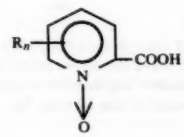
Int. Cl.³ C07D *213/73*

U.S. Cl. 546—310 10 Claims

1. Process for the production of a 2-aminopyridine having the formula:



from a 2-pyridine carboxylic acid-N-oxide having the formula:



wherein R is H or a —COOH group or an alkyl group having one to eight carbons or an aryl group, and n is a number between 1 and 4, comprised of converting said 2-pyridine carboxylic acid-N-oxide with a lower aliphatic carboxylic acid anhydride and a tertiary amine in the presence of a carboxylic acid nitrile, an intermediate conversion product resulting, and hydrolysing said intermediate conversion product, said 2-aminopyridine resulting.

4,496,734

METABOLITE

Roy L. McQuinn, White Bear Lake; William R. Bronn, Maplewood, and Elden H. Banitt, Woodbury, all of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Filed Nov. 15, 1983, Ser. No. 551,966

Int. Cl.³ C07D *211/76*

U.S. Cl. 546—221 2 Claims

1. Synthetic 5-hydroxy-N-(6-oxo-2-piperidylmethyl)-2-(2,2,2-trifluoroethoxy)benzamide.

4,496,735

CERTAIN PYRIDYLOXY-OR-THIO-PHENYL PROPENOIC ACID DERIVATIVES

Sachio Ohno; Kiyoshi Mizukoshi; Osamu Komatsu; Mitsuaki Nagasaka, all of Aichi, and Yoshiki Nakamura, Gifu, all of Japan, assignors to Maruko Seiyaku Co., Ltd., Nagoya, Japan

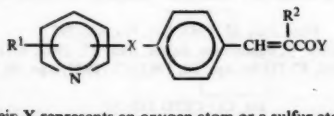
Filed Feb. 24, 1983, Ser. No. 469,475

Claims priority, application Japan, Feb. 24, 1982, 57-28392

Int. Cl.³ C07D *213/64, 213/65*

U.S. Cl. 546—301 6 Claims

1. A pyridine compound represented by the formula



(I)

wherein X represents an oxygen atom or a sulfur atom, R^1 and R^2, which may be the same or different, each represents hydrogen or a straight or branched chain alkyl group having 1 to 3 carbon atoms, Y represents —OH or —OR^3 wherein R^3 represents a straight or branched chain alkyl group having 1 to 4 carbon atoms, and the pharmaceutically acceptable salts thereof.

4,496,736

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS AND N-TERT.-ALKYLAMINES

Gerhard Bonse; Gerhard Marzolph, both of Cologne, and Heinz U. Blank, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

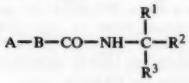
Filed Jun. 3, 1982, Ser. No. 384,470

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124652; Mar. 27, 1982, 3211326

Int. Cl.³ C07D *211/90, 53/134*

U.S. Cl. 546—327 19 Claims

1. A process for the simultaneous preparation of a carboxylic acid and N-tert.-alkylamine which comprises contacting a carboxylic acid N-tert.-alkylamide of the formula



wherein:

A represents an optionally substituted phenyl naphthyl or pyridyl radical;

B represents a single carbon bond, an aliphatic radical having 1 to 6 carbon atoms or a cycloaliphatic radical having 4 to 8 carbon atoms, it being possible for each carbon atom, independently of the others, to be substituted by a straight-chain or branched C_1–C_4-alkyl group, and

R^1, R^2 and R^3 are identical or different and independently of one another denote a straight-chain or branched alkyl group having 1 to 8 carbon atoms, it also being possible for R^1 and R^2 together to form an aliphatic ring, e.g. cyclo alkyl ring, having 4 to 8 ring members, or for R^1 to be an optionally substituted phenyl radical,

with a 5 to 50% strength by weight aqueous alkali metal hydroxide at 200° to 350° C. under elevated pressure while employing 1.0 to 1.3 mols of alkali metal hydroxide per mol of said carboxylic acid N-tert.-alkylamide, the reaction mixture consisting essentially of water, said aqueous alkali metal hydroxide and said N-tert.-alkylamide.

4,496,737

PROCESS FOR PREPARING SULFAMYLAMIDINE ANTISECRETORY AGENTS

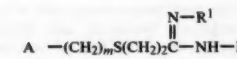
Jacob M. Hoffman, Jr., North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 27, 1982, Ser. No. 432,219

Int. Cl.³ C07D *277/42, 307/52*

U.S. Cl. 548—193 5 Claims

1. A process for preparing a compound having the formula:



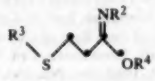
(I)

wherein:

A is a 5- or 6-membered heterocycle selected from the group consisting of pyridyl, imidazolyl, furanyl, thiazolyl, and oxadiazolyl, which can be optionally substituted by loweralkyl, di-loweralkylamino loweralkyl, N,N-di-loweralkylhydrazino, or guanidino;

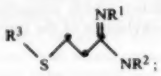
R^1 is sulfamoyl or substituted sulfamoyl wherein the substituent is (aralkyl or aryl:) phenyl, substituted phenyl, phenalkyl, or substituted phenalkyl, wherein the alkyl is of

1–4 carbons and the substituents are alkyl, loweralkyl, alkoxy, or halo;
R^2 is H or loweralkyl; and
m is 1–3;
said process comprising:
(a) reacting an alkylimidate having the formula:



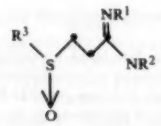
(II)

wherein R^2 is as defined above and R^3 and R^4 are independently alkyl, aryl or aralkyl, with a sulfamide to obtain a sulfide having the formula:



(III)

wherein R^1, R^2 and R^3 are as defined above;
(b) subjecting said sulfide (III) to peracid oxidation to obtain a sulfoxide having the formula:



(IV)

wherein R^1, R^2 and R^3 are as defined above;
(c) reacting said sulfide (III) or said sulfoxide (IV) in the presence of a hindered amine base to obtain an N-sulfamylacrylamidine having the formula:

(V)

wherein R^1 and R^2 are as defined above; and,
(d) reacting said N-sulfamylacrylamidine (V) with a heterocycle compound having the formula:

(VII)

wherein A and m are as defined above, to obtain said Formula I compound.

4,496,738

PROCESS FOR PREPARING 1,2,4-TRIAZOLE DERIVATIVES

Gerd Stubenrauch; Eberhard Ammermann, both of Ludwigshafen; Gerhard Hamprecht, Weinheim, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

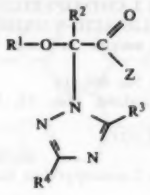
Continuation of Ser. No. 230,354, Jan. 30, 1981, abandoned, which is a continuation of Ser. No. 83,267, Oct. 10, 1979, abandoned. This application Jun. 18, 1982, Ser. No. 389,935

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 2846038

Int. Cl.³ C07D *249/08, 401/12, 405/12*

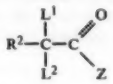
U.S. Cl. 548—262 **1 Claim**

1. A one step process for the preparation of a 1,2,4-triazole derivative of the formula I



(I)

where
R^1 is unsubstituted phenyl or phenyl substituted by halogen or trifluoromethyl, R^2 is hydrogen or methyl, R^3 and R^4 are each hydrogen and Z is hydroxy, which process comprises:
reacting a compound of the formula II

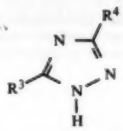


(II)

where R^2 and Z have the above meanings and L^1 and L^2 are nucleophilically displaceable leaving groups, with a hydroxy compound of the formula III

R^1—OH (III)

where R^1 has the above meaning, or a salt thereof, and with a 1,2,4-triazole of the formula IV



(IV)

where R^3 and R^4 have the above meanings, or a salt thereof, in the presence or absence of a solvent or diluent and/or an acid acceptor and in the presence or absence of a reaction accelerator.

4,496,739

INTERMEDIATES TO OPTICALLY ACTIVE CIS-1,3-DIBENZYL-HEXAHYDRO-1H-FURO[3,4-D]IMIDAZOLE-2,4-DIONE

Naohito Ohashi, Hyogo; Kozo Shimago, Osaka; Takaharu Ikeda, Osaka, and Kikuo Ishizumi, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

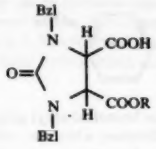
Filed Jan. 25, 1983, Ser. No. 460,797

Claims priority, application Japan, Jan. 27, 1982, 57-12132; Apr. 28, 1982, 57-71834; Apr. 28, 1982, 57-71837; Apr. 30, 1982, 57-73938

Int. Cl.³ C07D *233/34*

U.S. Cl. 548—321 **15 Claims**

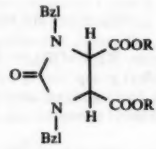
1. A cis-imidazolidinedicarboxylic acid monoester of the formula:



(III)

wherein R is a C_1–C_6 alkyl group and Bzl represents a benzyl group in a racemic form or an optically active form.

11. A cis-imidazolidinedicarboxylic acid diester of the formula:



(II)

wherein R is a C_1–C_6 alkyl group and Bzl represents a benzyl group.

4,496,740

REACTION PRODUCT OF POLYOL AND A METAL CARBONYL/PYRROLIDINE COMPLEX

P. Anthony Hinman, Torrance, Calif., assignor to Hitco, Irvine, Calif.

Division of Ser. No. 406,343, Aug. 9, 1982, Pat. No. 4,412,064. This application May 9, 1983, Ser. No. 492,720

Int. Cl.³ C07F *11/00, 13/00*

U.S. Cl. 548—402 **2 Claims**

1. A reaction product of a polyol containing more than two hydroxy groups and a metal complex, said metal complex being the reaction product of tungsten carbonyl, molybdenum carbonyl and/or rhenium carbonyl with pyrrolidine.

4,496,741

PROCESS FOR THE PREPARATION OF 5-AROYL-1,2-DIHYDRO-3H-PYRROLO[1,2-A]PYRROLE-1-CARBOXYLIC ACID DERIVATIVE

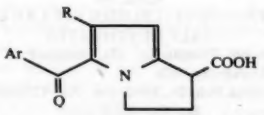
James B. Doherty, New Milford, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 24, 1983, Ser. No. 460,436

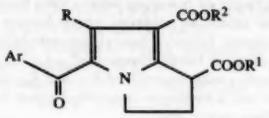
Int. Cl.³ C07D *487/02*

U.S. Cl. 548—453 **4 Claims**

1. A process for preparing 5-aroyl-1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-1-carboxylic acid derivatives of the structural formula:



wherein Ar is phenyl, C_{1-4}alkylphenyl, C_{1-4}alkoxyphenyl or halophenyl; R is H, C_{1-4}alkyl or halo comprising decarboxylating a diacid derivatives of the structural formula:



where R and Ar are as previously defined; and R^1 and R^2 independently are H, t-butyl, or benzhydryl in an acid selected from the group consisting of trifluoroacetic acid and trichloroacetic acid or a combination thereof.

4,496,742

ANALOGS OF 5,6-DIHYDRO PGI_2

Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

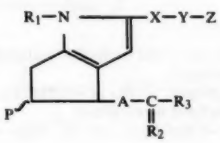
Continuation-in-part of Ser. No. 310,003, Oct. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 159,738, Jun. 16, 1980, Pat. No. 4,294,759, which is a continuation-in-part of Ser. No. 94,572, Nov. 15, 1979, abandoned. This application Oct. 4, 1982, Ser. No. 426,231

The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.

Int. Cl.³ C07D *209/52*

U.S. Cl. 548—516 **10 Claims**

1. A compound of the formula

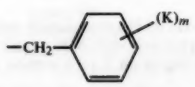


wherein Z is

(a) $—CO_2R_8$ wherein R_8 is a pharmaceutically acceptable metal cation, hydrogen, a straight or branched alkyl group having from 1 to 6 carbon atoms, phenyl, phenyl substituted in any position with from 1 to 3 substituents selected from chlorine or a straight or branched alkyl group having from 1 to 3 carbon atoms, or phenyl substituted in the para-position with $—NHCOR_{10}$, $—COR_{11}$, $—OCOR_{12}$, or $—CH=NNHCONH_2$ wherein R_{10} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or amino; R_{11} is methyl, methoxy, phenyl or amino; and R_{12} is phenyl or acetamidophenyl;

(b) $—CONR_{13}R_{14}$ wherein each of R_{13} and R_{14} is the same or different and is hydrogen, an alkyl group having from 1 to 8 carbon atoms, phenyl or benzyl;

(c) $—CH_2OR_5$ wherein R_5 is hydrogen, a straight or branched alkyl group having from 1 to 6 carbon atoms, benzoyl, a straight or branched alkanoyl group having from 2 to 5 carbon atoms, tetrahydropyranyl, trimethylsilyl, tert-butyldimethylsilyl, or



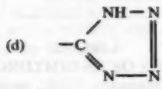
wherein K is a straight or branched alkyl group having from 1 to 6 carbon atoms, fluorine, chlorine, bromine, trifluoromethyl, a straight or branched alkoxy group having from 1 to 4 carbon atoms, phenyl, an alkanoyl group having from 2 to 5 carbon atoms, an alkanoylamido group having from 2 to 5 carbon atoms, nitro, or

(i) $—C0_2R_8$ wherein R_8 has the meaning defined hereinabove;

(ii) $-CH_2OR_{19}$, $-OR_{19}$, or $-SR_{19}$ wherein R_{19} is hydrogen, a straight or branched alkyl group having from 1 to 6 carbon atoms, an alkanoyl group having from 2 to 5 carbon atoms, benzoyl, benzyl, trimethylsilyl, tert-butyldimethylsilyl or tetrahydropyranyl; or

(iii) $-NR_{20}R_{21}$ wherein each of R_{20} and R_{21} is the same or different and is hydrogen or an alkyl group having from 1 to 6 carbon atoms; and

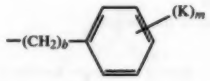
m is zero to 3 with the provisos that when K is phenyl, CO_2R_8 or $-CH_2OR_{19}$, m is 1, and when K is $-OR_{19}$ or $-SR_{19}$, m is 1 or 2; or

(d)  ;

wherein Y is $-CH_2CH_2-$, cis- or trans—CH=CH—, or $-CH_2CF_2$;

wherein X is $-(CH_2)_n$ wherein n is 1 to 5;

wherein R_1 is hydrogen, a straight or branched alkyl group having from 1 to 6 carbon atoms, a cycloalkyl group having from 3 to 7 carbon atoms, a bicycloalkyl group having from 6 to 10 carbon atoms, or



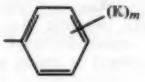
wherein b is zero or 1, and each of K and m has the meaning defined hereinabove;

wherein P is hydrogen, $\sim OR_5$ or $\sim CH_2OR_5$ wherein R_5 has the meaning defined hereinabove;

wherein A is $-CH_2CH_2-$, cis- or trans—CH=CH— or —C≡C—;

wherein R_2 is H,H; =O; α—R_4,β—R_4 wherein R_4 is hydrogen or an alkyl group having from 1 to 4 carbon atoms, and R_5 has the meaning defined hereinabove; and

wherein R_3 is cis-2-pentenyl, $-C(R_6)(R_7)$—B—E or $-C(R_6)(R_7)C_qH_{2q}CH_3$ wherein B is a bond, oxa, or alkylene moiety having from 1 to 6 carbon atoms; E is



wherein each of K and m has the meaning defined hereinabove; q is 1 to 4; and each of R_6 and R_7 is hydrogen, fluorine or an alkyl group having from 1 to 4 carbon atoms with the provisos that when R_5 is fluorine, R_7 is either hydrogen or fluorine, and when B is oxa, each of R_6 and R_7 is other than fluorine; and pharmaceutically acceptable salts thereof with the further overall proviso that each compound is other than one formed when the substituent groups Z, X, Y, R_1, P, R_2 and R_3 have the following meanings:

wherein Z is

(a) $-CO_2R_8$ wherein R_8 has the meaning defined hereinabove;

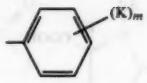
(b) $-CONR_{13}R_{14}$ wherein each of R_{13} and R_{14} is hydrogen, an alkyl group having from 1 to 6 carbon atoms, phenyl or benzyl;

(c) $-CH_2OR_5$ wherein R_5 is hydrogen, a straight or branched alkyl group having from 1 to 6 carbon atoms, benzoyl or an alkanoyl group having 2 carbon atoms;

wherein X is $-(CH_2)_n$ and n is 2 or 4;

wherein Y is $-CH_2CH_2-$; trans —CH=CH—; or $-CH_2CF_2$;

wherein R_1 is hydrogen, a straight or branched alkyl group having from 1 to 4 carbon atoms, a cycloalkyl group having from 3 to 7 carbon atoms or



wherein K is a straight or branched alkyl group having from 1 to 3 carbon atoms, fluorine, chlorine, trifluoromethyl, an alkoxy group having 1 carbon atom, phenyl, $-CO_2R_8$ wherein R_8 has the meaning defined hereinabove, or $-CH_2OR_{19}$ wherein R_{19} is hydrogen, a straight or branched alkyl group having from 1 to 6 carbon atoms, an alkanoyl group having 2 carbon atoms, or benzoyl; and mis zero to 3 with the proviso that when K is $-CO_2R_8$, $-CO_2OR_{19}$ or phenyl, m is 1;

wherein P is hydrogen, $\sim OR_5$ or $\sim CH_2OR_5$ and each R_5 is hydrogen;

wherein R_2 is H,H; =O; α—R_4,β—OR_5,β—R_4 wherein each R_4 is hydrogen or an alkyl group having from 1 to 3 carbon atoms; and each R_5 is hydrogen, an alkyl group having 1 carbon atom, or an alkanoyl group having 2 carbon atoms; and

wherein R_3 has the meaning defined hereinabove except that K as used therein has the following meaning: a straight or branched alkyl group having from 1 to 3 carbon atoms, fluorine, chlorine, trifluoromethyl, an alkoxy group having 1 carbon atom, phenyl, $-CO_2R_8$ wherein R_8 has the meaning defined hereinabove, or $-CH_2Or_{19}$ wherein R_{19} is hydrogen, a straight or branched alkyl group having from 1 to 6 carbon atoms, an alkanoyl group having 2 carbon atoms, or benzoyl.

4,496,743

1-[(ACYLTHIOCYCLOALKYL)CARBONYL]-L-PROLINE DERIVATIVES

Romeo Ciabatti, and Giovanna Padova, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

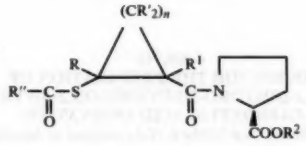
Division of Ser. No. 239,941, Mar. 3, 1981, Pat. No. 4,385,062. This application Jan. 26, 1983, Ser. No. 460,972

Claims priority, application United Kingdom, Mar. 7, 1980, 8007756

Int. Cl.³ C07D *207/16*

U.S. Cl. 548—533 **3 Claims**

1. A compound of the formula

VI 

wherein R, R^1, and R^2, each independently, represent hydrogen or a (C_1–C_4)alkyl radical, R'' stands for methyl or phenyl, n represents the integer 1, 2, 3, 4, or 5 and in each of the n (CR'_2) groups R' represents hydrogen or a (C_1–C_4)alkyl group.

4,496,744

MULTIDENTATE MACROMOLECULAR COMPLEX SALT CLATHRATES

Jerry L. Atwood, Tuscaloosa, Ala., assignor to University of Alabama, University, Ala.

Filed Feb. 28, 1980, Ser. No. 125,500

Int. Cl.³ C07F *5/06*

U.S. Cl. 549—208 **11 Claims**

1. A liquid chathrate of a crown ether complex salt of the formula:

$[M(\text{crown ether})_m]_x[Al_nR_{3n}X]_y \cdot pZ$

wherein M is a mono-, di- or trivalent cation, R is a lower alkyl group of 1 to 8 carbon atoms, X is a mono-, di- or trivalent anion, m is 1 or 2, n is 2, 3 or 4, x and y are each an integer of 1 to 3, Z is an aromatic hydrocarbon compound and p is an integer of 1 to 40.

4,496,745

EPOXYCARBACYCLIN DERIVATIVES, THEIR PREPARATION AND USE

Shigeo Amemiya, and Koichi Kojima, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

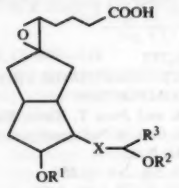
Filed Oct. 25, 1983, Ser. No. 545,097

Claims priority, application Japan, Oct. 26, 1982, 57/187760

Int. Cl.³ C07D *303/40, 407/14, 407/08*; C07F *7/18*

U.S. Cl. 549—215 **10 Claims**

1. Compounds of formula (I):



(I)

in which:

R^1 and R^2 are the same or different and each represents hydrogen or a hydroxy-protecting group;

R^3 represents an alkyl group having from 1 to 12 carbon atoms which is optionally substituted, an alkenyl group having from 2 to 12 carbon atoms, an alkynyl group having from 2 to 6 carbon atoms or a cycloalkyl group which is optionally substituted; and

X represents an ethylene group, a trans-vinylene group or an ethynylene group

and salts and esters thereof.

4,496,746

SYNTHESIS OF ALKENYL SATURATED ALIPHATIC POLYCARBOXYLIC ACID ANHYDRIDES

Justin C. Powell, Fairfax, Va., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,065

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—255 **10 Claims**

1. The method of preparing a product anhydride of an alkenyl saturated aliphatic polycarboxylic acid which comprises

maintaining a reaction mixture at 150° C.–300° C. containing an olefin oligomer reactant of molecular weight $\overline{M}_n$ of 250–5000 and a catalyst;

adding thereto, over the course of reaction, a dispersion containing an anhydride of an unsaturated aliphatic polycarboxylic acid, in amount of 0.5–5 moles per mole of olefin oligomer reactant in said reaction mixture, dispersed, in the presence of dispersing amount of a dispersing agent, in a non-aqueous diluent-solvent thereby forming product anhydride of an alkenyl saturated aliphatic polycarboxylic acid; and

recovering said product anhydride of said alkenyl saturated aliphatic polycarboxylic acid.

4,496,747

PROCESS FOR THE PREPARATION OF DEHYDROACETIC ACID

Robert J. Clemens, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,396

Int. Cl.³ C07D *309/38*

U.S. Cl. 549—291 **8 Claims**

1. A process for the preparation of dehydroacetic acid which comprises heating 2,2,6-trimethyl-4H-1,3-dioxin-4-one in the absence of a catalyst and recovering the dehydroacetic acid produced therefrom.

4,496,748

SUBSTITUTED MACROBICYCLIC ETHERS, THE MANUFACTURE AND USE THEREOF

Helmut Gebauer, Munich, Fed. Rep. of Germany, assignor to Consortium Für Elektrochemische Industrie GMBH, Munich, Fed. Rep. of Germany

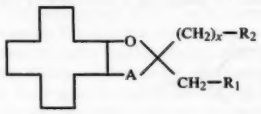
Filed Aug. 4, 1982, Ser. No. 404,984

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3137939

Int. Cl.³ C07D *311/94*

U.S. Cl. 549—396 **2 Claims**

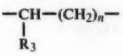
1. A compound of the formula



wherein

R_1 and R_2 represent hydrogen or optionally branched alkyl groups having from 1 to 6 carbon atoms or optionally branched alkenyl groups having from 3 to 6 carbon atoms,

A represents a bivalent hydrocarbon radical of the formula



wherein

R_3 represents hydrogen or methyl, and

n and x are both 1.

4,496,749

OLIGOMERS OF PERFLUORO(2,2-DIMETHYL-1,3-DIOXOLE) AND THEIR FLUORINATION PRODUCTS

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

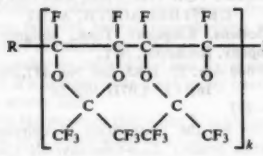
Division of Ser. No. 279,867, Jul. 2, 1981, Pat. No. 4,409,393. This application Sep. 23, 1982, Ser. No. 421,825

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.³ C07D *317/10*

U.S. Cl. 549—448 **1 Claim**

1. An oligomer of perfluoro(2,2-dimethyl-1,3-dioxide) containing at least one chain having the following formula:



where k is 1 to about 4, and at least one of R and R_1 is the fluorocarbonyl group, while the other one of R and R_1 may also be hydrogen.

4,496,750

CYCLIC MONOMERS DERIVED FROM TRIFLUOROPYRUVATE ESTERS

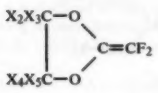
Burton C. Anderson; David C. England, and Paul R. Resnick, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 306,390, Sep. 28, 1981, Pat. No. 4,429,143. This application Sep. 13, 1982, Ser. No. 417,698

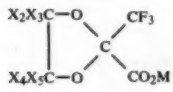
Int. Cl.³ C07D *317/00*

U.S. Cl. 549—455 **4 Claims**

1. A process for preparing a dioxolane of the formula:

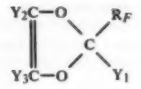


wherein X_2, X_3, X_4 and X_5, independently, are Cl or F, provided that at least two are F, comprising pyrolyzing the dioxolane of the formula

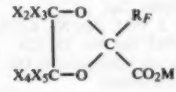


wherein: X_2 to X_5, independently, are Cl or F, at least two of which are F, and M is an alkali metal, at a temperature of about 140° C. to 200° C.

3. A process for preparing the dioxole of the formula



wherein Y_1 and Y_2 are Cl and Y_3 is F or Cl, comprising pyrolyzing the dioxolane of the formula



wherein: R_F is C_1 to C_4 perfluoroalkyl, M is an alkali metal, X_2, X_3 and X_4 are each Cl and X_5 is Cl or F, at a temperature of about 140° C. to 200° C.

4,496,751

DIFUNCTIONAL FURAN DERIVATIVES

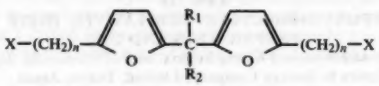
Richard H. Still, Disley; John L. Cawse, Manchester, and John L. Stanford, Flixton, all of England, assignors to The University of Manchester Institute of Science & Technology, Manchester, England

Filed Apr. 1, 1983, Ser. No. 481,370

Int. Cl.³ C07D *307/52, 307/66*

U.S. Cl. 549—472 **10 Claims**

1. Compounds of the formula (I)



(I)

in which R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, unsubstituted ethyl radicals, methyl radicals, vinyl radicals, halogen substituted vinyl radicals, halogen substituted methyl radicals and halogen substituted ethyl radicals, X is a $—NH_2$ or —NCO group, and n is 0 or 1 with the proviso that n is not 0 when X is $—NH_2$.

4,496,752

PRODUCTION OF EPOXY COMPOUNDS FROM OLEFINIC COMPOUNDS

Abraham P. Gelbein, Plainfield, and Joon T. Kwon, Freehold Township, Monmouth County, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed May 3, 1979, Ser. No. 35,558

Int. Cl.³ C07D *301/26;* **C25B** *1/46, 3/02*

U.S. Cl. 549—521 **18 Claims**

1. A process for converting an olefinically unsaturated compound to the corresponding epoxy compound, comprising:

contacting a tertiary alkanol in an inert organic solvent, chlorine and aqueous alkali to produce tertiary alkyl hypochlorite, at a temperature of from 5° to 220° F.; separating an organic phase of tertiary alkyl hypochlorite in the inert organic solvent; contacting tertiary alkyl hypochlorite in the inert organic solvent, water and an olefinically unsaturated compound to produce the corresponding chlorohydrin and a tertiary alkanol, at a temperature of from 32° F. to 160° F. said water having a salt dissolved therein to enhance extraction of the tertiary alkanol and chlorohydrin into the inert organic solvent; separating an organic phase of chlorohydrin and tertiary alkanol in the inert organic solvent; contacting cholorohydrin and tertiary alkanol in the inert organic solvent and aqueous alkali to convert the chlorohydrin to the corresponding epoxy compound; recovering said epoxy compound; separating an organic phase of the tertiary alkanol in the inert organic solvent; and passing tertiary alkanol in the inert organic solvent to the contacting with chlorine and aqueous alkali.

10. A process for converting an olefinically unsaturated compound to the corresponding epoxy compound, comprising:

contacting a tertiary alkanol in an inert organic solvent, chlorine and aqueous electrolyte containing sodium chloride and sodium hydroxide obtained from an electrolytic cell for producing chlorine to produce tertiary alkyl hypochlorite and an aqueous brine; separating an organic phase of tertiary alkyl hypochlorite in the inert organic solvent from aqueous brine for recycle of aqueous brine to the electrolytic cell; contacting tertiary alkyl hypochlorite in the inert organic solvent, water and an olefinically unsaturated compound to produce the corresponding chlorohydrin and tertiary alkanol, said water having a salt dissolved therein to enhance extraction of the tertiary alkanol and chlorohydrin into the inert organic solvent; separating an organic phase of chlorohydrin and tertiary alkanol in the inert organic solvent; contacting chlorohydrin

and tertiary alkanol in the inert organic solvent and aqueous electrolyte containing sodium chloride and sodium hydroxide from the electrolytic cell to convert the chlorohydrin to the corresponding epoxy compound and produce aqueous brine; recovering the epoxy compound; separating an aqueous brine phase from an organic phase of tertiary alkanol in the inert organic solvent; passing tertiary alkanol in the inert organic solvent to the contacting with chlorine and aqueous electrolyte; employing aqueous brine generated in producing epoxy compound in the contacting of tertiary alkanol with chlorine and electrolyte prior to recycle to the cell to convert any tertiary alkanol present therein to tertiary alkyl hypochlorite; recovering from the chlorohydrin production a water phase; and recycling recovered water phase to the chlorohydrin production.

4,496,753

SAPONIFICATION OF CHLOROHYDRINS

Joon T. Kwon, Freehold Township, Monmouth County, and George D. Suciu, Ridgewood, both of N.J., assignors to Lummus Crest, Inc., Bloomfield, N.J.

Filed Sep. 26, 1983, Ser. No. 535,903
Int. Cl.[3] C07D *301/26*
U.S. Cl. 549—521 **15 Claims**

1. In a process for the saponification of a chlorohydrin to an epoxy compound with an aqueous base, the improvement comprising:

saponifying the chlorohydrin in a first and second stage, said first stage being under high back-mix conditions, said second stage being under plug-flow conditions, and at least a portion of the effluent from the first stage being introduced into the second stage.

4,496,754

SILYL CARBAMATES AND SYNTHESIS THEREOF

Bernard Kanner, West Nyack; Steven P. Hopper, Mahopac, both of N.Y., and Dennis J. Sepelak, McMurray, Pa., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 28, 1982, Ser. No. 454,178
Int. Cl.[3] C07F *7/10, 7/18*
U.S. Cl. 556—420 **26 Claims**

1. A process for preparing silyl carbamates which comprises reacting, under suitable reaction conditions, one or more silanes represented by the general formula:

$$R_{4-x}SiH_x$$

wherein R is individually an aliphatic or aromatic, saturated or unsaturated hydrocarbon or alkoxy radical containing from one to twelve carbon atoms, inclusive, and x has a value of from one to two; with one or more ammonium carbamates or corresponding carbamic acid compounds selected from ammonium, carbamates represented by the general formula:

$$R'R''NH_2^{\oplus}R'R''NCO_2^{\ominus}$$

or from the group of carbamic acid compounds represented by the general formula:

$$R'R''NCOOH$$

wherein R′ and R″ are individually hydrogen or an aliphatic saturated or unsaturated hydrocarbon radical containing from one to twelve carbon atoms inclusive, and thereafter recovering, said silyl carbamate, said recovered silyl carbamate being represented by the general formula:

$$R_{4-x}Si(O_2CNR'R'')_x$$

wherein R, R′, R″ and x are as previously defined.

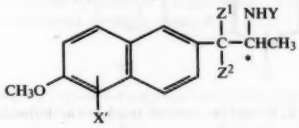
4,496,755

OPTICALLY ACTIVE 1-(6-METHOXY-2-NAPHTHYL)-2-(ALKOXYCARBONYL) AMINO-1-PROPANONE, ITS DERIVATIVES AND THEIR HALO ANALOGS AND THE METHODS FOR THEIR MANUFACTURE

Genichi Tsuchihashi, Tama; Shuichi Mitamura, Sagamihara; Koji Kitajima, Yokohama, and Kumi Kobayashi, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,768
Claims priority, application Japan, Mar. 31, 1982, 57-051397
Int. Cl.[3] C07C *125/067, 125/02*
U.S. Cl. 560—028 **10 Claims**

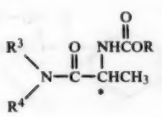
1. A process for preparing an optically active 1-(6-methoxy-2-naphthyl)-2-(alkoxycarbonyl)amino-1-propanone derivatives and their halo analogs represented by the formula



(XI)

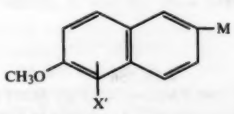
wherein X′ is hydrogen or a halogen atom at 5 or 7 position of the naphthyl moiety; Z_1 and Z_2 together with its two bonds is an oxo group or Z_1 and Z_2 are OR^1 groups wherein R^1 represents a lower alkyl group or both R^1s may form, when taken together an alkylene group with 2 to 6 carbon atoms; Y is —COOR (wherein R is a lower alkyl group optionally substituted with one or more non-interfering substituents selected from hydroxy, alkoxy, acyloxy, nitro, alkylamino, halogen and carbonyl) or hydrogen; Z_1 and Z_2 are OR^1 groups when Y is hydrogen; the asterisk mark indicates an asymmetric carbon atom, which comprises:

(a) contacting an amide represented by the formula



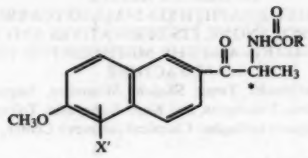
(VII)

wherein R is as defined above; R^3 is a lower alkyl group; R^4 is a lower alkyl group or a lower alkoxy group, in an inert atmosphere and in an inert solvent comprising an ether, optionally first with a compound selected from the group consisting of alkyl lithium, aryl lithium, a Grignad r reagent, and alkali metal hydride, then with an organic metallic compound represented by the formula



(VI)

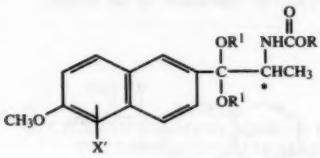
wherein X′ is as defined above; M represents MgX wherein X is a halogen atom, or Li, to obtain optically active 1-(6-methoxy-2-naphthyl)-2-(alkoxycarbonyl)amino-1-propanone and its halo analogs represented by the formula



(I)

wherein X', R and the asterisk mark as defined above; and optionally

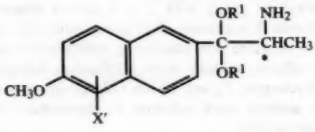
(b) converting the compound of Formula (I) to a corresponding acetal represented by the formula:



(II)

wherein X', R, R^1 and the asterisk mark are as defined above; and further optionally

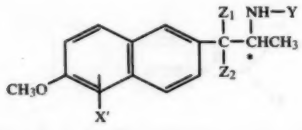
(c) contacting the compound of Formula (II) with a base to form the corresponding amino acetal represented by the formula



(III)

wherein X', R^1 and the asterisk mark are defined as above.

8. An optically active compound of the formula



(XI)

wherein X' is hydrogen or a halogen atom at 5 or 7 position of the naphthyl moiety, Z_1 and Z_2 together with its two bonds in an oxo group or Z_1 and Z_2 are OR^1 groups wherein R^1 represents a lower alkyl group or both R^1s may form, when taken together an alkylene group with 2 to 6 carbon atoms; Y is —COOR (wherein R is a lower alkyl group optionally substituted with one or more non-interfering substituents selected from hydroxy, alkoxy, acyloxy, nitro, alkylamino, halogen and carbonyl) or hydrogen; Z_1 and Z_2 are OR^1 groups when Y is hydrogen; the asterisk mark indicates an asymmetric carbon atom.

4,496,756

PROCESS FOR PREPARING AMINO ACID ESTERS

Dennis P. Bauer, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 1, 1983, Ser. No. 528,462
Int. Cl.³ C07C *101/02*
U.S. Cl. 560—41 **15 Claims**

1. A process which comprises reacting (1) an enolizable organic compound corresponding to the formula:

wherein X is a leaving group and R and R' are independently selected from hydrogen and innocuous substituents with (2) an acid amide, (3) an alcohol, (4) carbon monoxide, and (5) hydrogen in a homogeneous reaction mixture containing a cobalt carbonylation catalyst, an alkali metal alcoholate, and methyl isobutyl ketone so as to form an N-acylamino acid ester.

4,496,757

ULTRAVIOLET-ABSORBING STABILIZERS SUBSTITUTED AN ALIPHATIC HYDROXYL GROUP

Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 318,648, Nov. 5, 1981, Pat. No. 4,414,393. This application Sep. 30, 1982, Ser. No. 431,498
Int. Cl.³ C07C *69/593*
U.S. Cl. 560—82 **5 Claims**

1. An ultraviolet-absorbing, matrix-reactive compound having the formula

$$E\text{-}(G\text{-}R)_n \qquad (I)$$

or

$$L\text{-}(G\text{-}E)_m \qquad (II)$$

wherein

E is a radical derived from a benzalmalonate

G is —OCH_2CHOH— where E is attached to the oxygen atom,

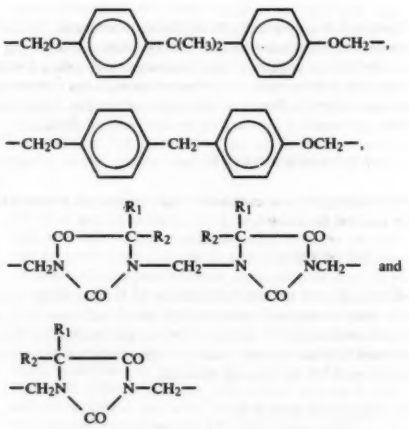
R is alkyl of 1 to 18 carbon atoms, phenyl, p-tolyl or —CH_2OT where

T is alkyl of 1 to 20 carbon atoms or alkenyl of 3 to 20 carbon atoms,

n is 1 or 2

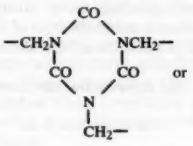
m is 2 or 3,

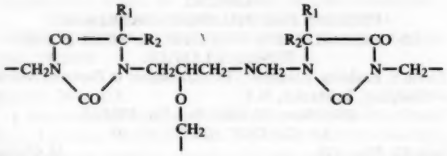
L, when m is 2, is a direct bond, alkylene of 1 to 6 carbon atoms, phenylene, or a radical selected from the group consisting of



where R_1 and R_2 are independently alkyl of 1 to 6 carbon

atoms or together are tetramethylene or pentamethylene, or L, when m is 3, is





Q has the same meaning as L where m is 2, and p is 1 to 4.

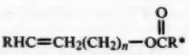
4,496,758

PROCESS FOR THE METATHESIS OF ALKENYL ESTERS

Charles W. Blewett, Fort Mitchell, Ky., and Michael D. Sublett, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,757
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—112 **26 Claims**

1. A metathesis process which comprises contacting an alkenyl ester of the general formula

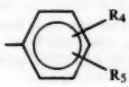


where R is hydrogen or an alkyl group having from 1 to 10 carbon atoms, n is an integer from 2 to 20 and R* is

(a) a tertiary alkyl group having from 4 to 20 carbon atoms of the formula

where R_1, R_2 and R_3 represent the same or different alkyl groups having from 1 to 9 carbon atoms, or

(b) a phenyl or substituted-phenyl group of the formula



where R_4 and R_5 are hydrogen, halo or an alkyl group having from 1 to 8 carbon atoms, with a tungsten hexachloride/tetraalkyltin catalyst at a temperature from 0° C. to 220° C., said tungsten hexachloride present in an amount from 0.1 to 5 mole percent, based on the alkenyl ester, with the molar ratio of tetraalkyltin to tungsten hexachloride ranging from 0.4:1 to 6:1.

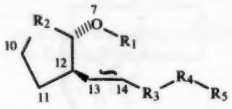
4,496,759

NOVEL PROSTAGLANDIN ANALOGUES AND PROCESS FOR MAKING SAME

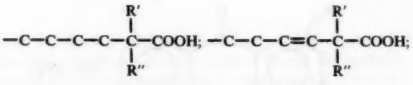
Edward D. Mihelich, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

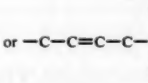
Division of Ser. No. 239,765, Mar. 2, 1981, Pat. No. 4,345,981.
This application May 5, 1982, Ser. No. 375,080
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **11 Claims**

1. The 7-oxa-11-deoxy prostaglandin analogues of the formula



wherein the C_{13}–C_{14} bond is a single bond, cis double bond, or trans double bond, or triple bond; R_1 is

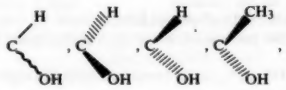




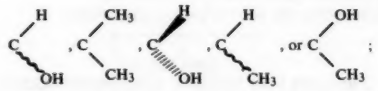
wherein

R′ and R″ are each H, CH_3, C_2H_5 or C_3H_7; R_2 is C=O or

R_3 is CH_2, C=O,



R_4 is CH_2, C=O,



R_5 is C_2H_5 or C_4H_9 and the methyl and t-butyl esters thereof.

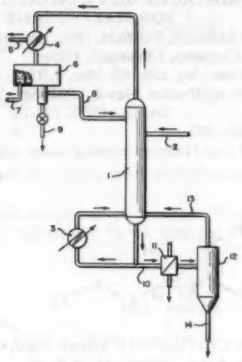
4,496,760

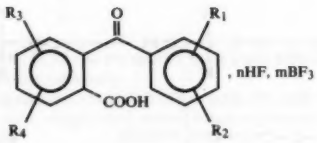
PROCESS OF DECOMPOSITION OF A COMPLEX OF ORTHO-BENZOYL BENZOIC ACID, HYDROGEN FLUORIDE AND BORON TRIFLUORIDE

Michel Devic, Lyons, France, assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Aug. 17, 1983, Ser. No. 523,945
Claims priority, application France, Sep. 1, 1982, 82 14920
Int. Cl.³ C07C *59/76*
U.S. Cl. 562—460 **22 Claims**

1. A process for the decomposition of complexes of ortho-benzoyl benzoic acid hydrogen fluoride, and boron trifluoride of the general formula:





wherein R_1, R_2, R_3, and R_4 represent hydrogen, a halogen atom, or a straight or branched chain alkyl group having 1 to 5 carbon atoms, and n and m are any integer from 1 to 6, to obtain ortho-benzoyl benzoic acid separate from hydrogen fluoride and boron trifluoride, in high yield which comprises:

(a) mixing said complex with HF to form a solution;

(b) feeding said solution into a distillation column having more than eight theoretical plates and in which a solvent reflux is established at a location in the top upper third of said column where the temperature is between 20° and 150° C. and the pressure is between 1 and 15 bars;

(c) operating said column with a solvent feed rate which is between about 5 and 40 times by weight of the feed rate of said solution to the column;

(d) recovering the ortho-benzoyl benzoic acid by evaporating any solvent present with said acid in the boiler of the column; and

(e) recovering HF, BF_3, and solvent vapors at the upper part of the column;

(f) separating BF_3 from the recovered compounds of step (e) by condensing the HF and solvent;

(g) separating HF from the solvent; and

(h) recycling the solvent back to the column.

4,496,761

PROCESS FOR MAKING CARBOHYDRAZIDE

Paul H. Lange, Jr., New Haven, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Aug. 17, 1982, Ser. No. 408,970

Int. Cl.³ C07C *133/02*

U.S. Cl. 564—37 **10 Claims**

1. A process for making carbohydrazide comprising:

(a) reacting hydrazine with a di(lower alkyl) carbonate at a temperature below about 80° C. for a sufficient amount of time to form a first reaction mixture comprising the corresponding lower alkyl carbazate and the corresponding lower alkanol, wherein the mole ratio of hydrazine added to di(lower alkyl) carbonate is from about 0.9:1 to about 1.1:1;

(b) removing at least a portion of said lower alkanol from said first reaction mixture;

(c) then adding additional hydrazine to said remaining first reaction mixture and reacting a portion of said additional hydrazine with said lower alkyl carbazate at a temperature below about 80° C. for a sufficient amount of time to form a second reaction mixture comprising carbohydrazide, the corresponding lower alkanol and unreacted hydrazine, wherein the mole ratio of hydrazine added to said lower alkyl carbazate is from about 1.5:1 to about 4:1; and

(d) recovering said carbohydrazide from said second reaction mixture.

4,496,762

PROCESS FOR THE PREPARATION OF N-(2-(CYCLO-HEXEN-1-YL)ETHYL)-4-METHOXYBENZENEACETAMIDE

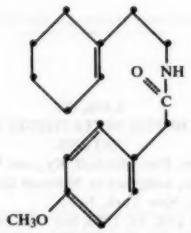
David S. Kashdan, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1983, Ser. No. 480,039

Int. Cl.³ C07C *103/76, 102/08*

U.S. Cl. 564—170 **16 Claims**

1. Process for the preparation of a compound having the formula



which comprises the steps of

(A) hydrogenating 2-cyano-1-oxaspiro[2]nonane in the presence of a hydrogenation catalyst to obtain 1-cyanomethylcyclohexanol, wherein the hydrogenation is discontinued after the uptake of about one mole equivalent of hydrogen;

(B) hydrogenating the product of Step (A) in the presence of a hydrogen treated rhodium catalyst suspended in an acidic solvent to obtain 1-(2-aminoethyl)cyclohexanol;

(C) reacting the product of Step (B) with 4-methoxyphenylacetic acid to obtain a mixture of compounds comprising N-[2-(1-hydroxy-1-cyclo-hexyl)ethyl]-4-methoxybenzeneacetamide and N-[2-(cyclohexen-1-yl)ethyl]-4-methoxybenzene acetamide;

(D) dehydrating the product mixture of Step (C).

4,496,763

PROCESS FOR THE PREPARATION OF ALKYL-SUBSTITUTED ANILINES

Helmut Le Blanc, Burscheid, and Karlfried Wedemeyer, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,563

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125295; Dec. 2, 1981, 3147734

Int. Cl.³ C07C *85/06*

U.S. Cl. 564—402 **18 Claims**

1. In a process for the preparation of an alkyl-substituted aniline by contacting an alkyl substituted phenol in the vapor phase with ammonia in the presence of an aluminum oxide catalyst, the improvement wherein the process is carried out by passing said alkyl-substituted phenol and ammonia in the vapor phase through a reactor containing said aluminum oxide catalyst at a flow rate of at least 20 cm/hour, relative to liquid volumes using a molar ratio of ammonia to phenol of at least

about 2:1, and a minimum pressure of 15 bars and at a temperature of about 360° to 460° C.

4,496,764

PROCESS FOR THE PREPARATION OF 4-AMINO-3-METHYL-PHENOL

Guido Skipka, Bonn; Hans-Ulrich Alles; Gert Randau, both of Odenthal, and Manfred Niese, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 275,538, Jun. 19, 1981, abandoned. This application Jan. 14, 1983, Ser. No. 457,834

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025805

Int. Cl.³ C07C *85/11*

U.S. Cl. 564—418 **15 Claims**

1. A process for the preparation of 4-amino-3-methyl-phenol from 4-nitroso-3-methyl-phenol, which comprises contacting said 4-nitroso-3-methyl-phenol with iron in an acid aqueous medium at a temperature of 20° to 100° C. said medium having a pH in the range from 2 to 6.5.

4,496,765

PREPARATION OF 2-(METHYLTHIOMETHYL)-6-(TRIFLUOROMETHYL-)ANILINE FROM ORTHO-AMINOBENZOTRIFLUORIDE

Audrey Y. Ku, Chesterfield; John P. Chupp, Kirkwood, and Terry M. Balthazor, University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 7, 1983, Ser. No. 530,153

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—440 **14 Claims**

1. A process for preparing 2-(methylthiomethyl)-6-(trifluoromethyl) aniline, which process comprises the steps of:

(a) reacting ortho-aminobenzotrifluoride with dimethyl sulfide and N-chlorosuccinimide in an inert solvent to produce N-(2-trifluoromethylphenyl)-S,S-dimethyl sulfilimine hydrochloride and succinimide;

(b) treating the sulfilimine hydrochloride product with aqueous base to neutralize said sulfilimine hydrochloride to N-(2-trifluoromethylphenyl)-S,S-dimethyl sulfilimine and to form separate aqueous and organic phases, at least a major portion of succinimide product being dissolved in said aqueous phase;

(c) separating said organic phase containing said neutral sulfilimine from said aqueous phase containing said succinimide product;

(d) subjecting said neutral sulfilimine in said organic phase to catalytic rearrangement in the presence of a minor amount of succinimide to form 2-(methylthiomethyl)-6-(trifluoromethyl) aniline;

(e) reacting said succinimide product in said aqueous phase with chlorine to produce N-chlorosuccinimide; and

(f) recycling said N-chlorosuccinimide produced in step (e) for use as a reagent in step (a).

4,496,766

PROCESS FOR PRODUCTION OF α,β-UNSATURATED KETONES

Jiro Tsuji, Kamakura, and Isao Shimizu, Tokyo, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

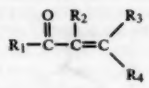
Filed May 4, 1983, Ser. No. 491,380

Claims priority, application Japan, May 4, 1982, 57-74747

Int. Cl.³ C07C *45/65*

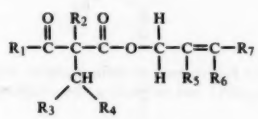
U.S. Cl. 568—346 **13 Claims**

1. A process for producing an α,β-unsaturated ketone of the general formula



wherein R_1 represents an alkyl or alkylene group, R_2 represents an alkyl, alkenyl, alkynyl, alkylene, alkoxycarbonyl, alkeneoxycarbonyl, alkoxyalkyl or alkoxycarbonylalkyl group, R_3 and R_4 represent a hydrogen atom or an alkyl or alkylene group, and R_1, R_2, R_3, and R_4 may be linear or may form a ring when taken together in arbitrary combinations,

which comprises contacting an α-disubstituted-β-keto acid ester of the general formula



wherein R_1, R_2, R_3 and R_4 are as defined, and R_5, R_6 and R_7 represent a hydrogen atom or an alkyl group, said α-disubstituted-β-keto acid ester being an ester formed between a keto acid having not more than 20 carbon atoms and an allylic alcohol having not more than 6 carbon atoms, with a catalyst consisting essentially of (a) a palladium compound and (b) an α,ω-C_2–C_4 alkylenedi(di-alkyl or phenyl-substituted)phosphine.

4,496,767

PROCESS FOR PREPARING 2-CYCLOPENTENONE DERIVATIVES

Masayoshi Minai, Moriyama, and Tadashi Katsura, Suita, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

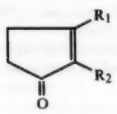
Filed Oct. 18, 1983, Ser. No. 543,152

Claims priority, application Japan, Oct. 27, 1982, 57-189883

Int. Cl.³ C07C *45/65*

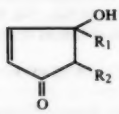
U.S. Cl. 568—346 **13 Claims**

1. A process for preparing 2-cyclopentenones of the formula:



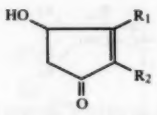
(V)

wherein R_1 is hydrogen, alkyl or alkenyl and R_2 is alkyl, alkenyl, alkynyl, cycloalkyl, aryl or aralkyl, which comprises esterifying a mixture of a 3-hydroxy-4-cyclopentenone of the formula:



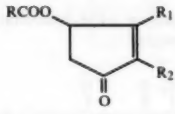
(II)

wherein R_1 and R_2 are each as defined above and a 4-hydroxy-2-cyclopentenone of the formula:



(III)

wherein R_1 and R_2 are each as defined above with an aliphatic carboxylic acid to give a mixture of the 4-hydroxy-2-cyclopentenone (III) and a cyclopentenone ester of the formula:



(IV)

wherein R_1 and R_2 are each as defined above and R is hydrogen or C_1–C_4 alkyl and subjecting the resulting mixture to reduction.

4,496,768

PROCESS FOR THE PRODUCTION OF ALDEHYDES BY HYDROFORMYLATION OF ALPHA-OLEFINS

Alan J. Dennis, Middlesbrough; George E. Harrison, Billericay, and James P. Wyber, Stockton-on-Tees, all of England, assignors to Davy McKee Limited, London, England

Filed Jun. 7, 1983, Ser. No. 501,859

Claims priority, application United Kingdom, Nov. 6, 1982, 8217037

Int. Cl.[3] **C07C** *45/50*

U.S. Cl. 568—454 **15 Claims**

1. A continuous process for the production of an aldehyde by hydroformylation of an alpha-olefin feedstock selected from the group consisting of alpha-olefins and substituted alpha-olefins which comprises:

providing a hydroformylation zone containing a charge of a liquid reaction medium having dissolved therein a complex rhodium hydroformylation catalyst comprising rhodium in complex combination with carbon monoxide and with a cyclic phosphite having a bridgehead phosphorus atom linked to three oxygen atoms at least two of which form together with the bridgehead phosphorus atom part of a ring;

continuously supplying said alpha-olefin feedstock to the hydroformylation zone;

maintaining in the hydroformylation zone a temperature in the range of from about 40° C. to about 160° C. and a pressure in the range of from about 4 bar to about 75 bar;

supplying make-up hydrogen and carbon monoxide to the hydroformylation zone; and

recovering from the liquid hydroformylation medium a hydroformylation product comprising at least one aldehyde.

4,496,769

PROCESS FOR THE PREPARATION OF ALDEHYDES BY HYDROFORMYLATION OF OLEFINS

Alan J. Dennis, Middlesbrough; George E. Harrison, Billericay, and James P. Wyber, Stockton-on-Tees, all of England, assignors to Davy McKee (London) Limited, London, England

Filed Jun. 7, 1983, Ser. No. 501,920

Claims priority, application United Kingdom, Jun. 11, 1982, 8217038

Int. Cl.[3] **C07C** *45/50*

U.S. Cl. 568—454 **10 Claims**

1. In a hydroformylation process for the production of an aldehyde by hydroformylation of an olefin which comprises contacting an olefin with carbon monoxide and hydrogen in a hydroformylation zone containing a charge of a liquid reaction medium having dissolved therein a catalytic amount of a complex rhodium hydroformylation catalyst comprising rhodium in complex combination with carbon monoxide and with an organic phosphite ligand of the general formula:

$$(RO)_3P \qquad (I)$$

in which each R represents a radical selected from hydrocarbyl radicals and substituted hydrocarbyl radicals under temperature and pressure conditions conducive to hydroformylation of the olefin, the improvement comprising:

continuously supplying olefin and make-up hydrogen and carbon monoxide to the hydroformylation zone; and

supplying make-up phosphite ligand of the general formula (I) to the hydroformylation zone at a rate sufficient to maintain a predetermined level of free phosphite ligand in the liquid reaction medium and thereby to maintain the catalytic activity of the complex rhodium hydroformylation catalyst.

4,496,770

PROCESS FOR THE PREPARATION OF α-ALKYLACROLEINS

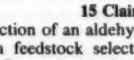
Gerd Duembgen, Dannstadt-Schauernheim; Gerd Fouquet, Neustadt; Richard Krabetz, Kirchheim; Ekhart Lucas, Wachenheim; Franz Merger, Frankenthal, and Friedbert Nees, Stutensee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,475

Int. Cl.[3] **C07C** *47/22*

U.S. Cl. 568—463 **10 Claims**

1. In a process for the preparation of an α-alkylacrolein of the formula



(I)

where R^1 is n-alkyl of 1 to 8 carbon atoms which may be further substituted by alkoxy or alkyl of 1 to 4 carbon atoms, by reacting an alkanal of the formula

$$R^1—CH_2—CHO \qquad (II),$$

where R^1 has the above meanings, with formaldehyde in the presence of a secondary amine in the presence or absence of an acid, at from 150° to 300° C.,

the improvement which comprises carrying out the reaction in the liquid phase under superatmospheric pressure at above 150° C. for not more than 25 minutes, using from 0.001 to 0.25 equivalent of amine per mole of alkanal II.

4,496,771

PROCESS FOR PREPARING THE COMPOUND 1-DECYLOXY-4-[(7-OXA-4-OCTYNYL)-OXY]-BENZENE

Pietro Massardo; Franco Bettarini; Ennio Bianchini both of Novara and Paolo Piccardi, Milan, all of Italy, Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

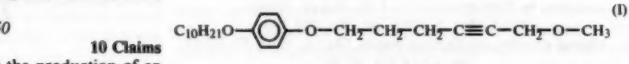
Filed Mar. 3, 1983, Ser. No. 471,706

Claims priority, application Italy, Mar. 4, 1982, 19957 A/82

Int. Cl.[3] **C07C** *41/16, 43/205*

U.S. Cl. 568—651 **5 Claims**

1. A process for preparing compound 1-decyloxy-4-[(7-oxa-4-octynyl)-oxy]-benzene of formula:



(I)

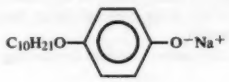
characterized in that the sodium salt of methyl-propargyl-ether of formula:

$$CH_3—O—CH_2—C\equiv C^-Na^+$$

is reacted in liquid ammonia at a temperature of −33° C. and in a nitrogen atmosphere with a substantially equimolecular amount of 1-bromo-3-chloro-propane in anhydrous tetrahydrofuran, thus obtaining compound 1-methoxy-6-chloro-hexyne-2 of formula:

$$CH_3O—CH_2—C\equiv C—CH_2—CH_2—CH_2—Cl \qquad (II)$$

which is reacted in an inert polar solvent and at a temperature ranging from room temperature to 70° C. with a substantially equimolecular amount of sodium salt of 4-decyloxy-phenol of formula:



4,496,772

PREPARATION OF NITROALCOHOLS

John T. Lai, Broadview Heights, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Filed Jul. 8, 1983, Ser. No. 512,081
Int. Cl.³ C07C *79/18*
U.S. Cl. 568—704 **11 Claims**

1. In a process for preparing a nitroalcohol by reacting a nitroparaffin with an aldehyde, the improvement comprising the step of conducting the reaction in the presence of trialkyl phosphine catalyst.

4,496,773

PROCESS FOR THE PREPARATION OF 1,1'-BI-2-NAPHTHOLS

Robert C. Clouse, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1983, Ser. No. 479,399
Int. Cl.³ C07C *39/14*
U.S. Cl. 568—730 **15 Claims**

1. A process for coupling 2-naphthols which comprises contacting a 2-naphthol dissolved in a polar acidic organic solvent in the presence of a catalytic amount of a catalyst which comprises a readily reducible form of a Group IB, Group VIII or manganese metal in the further presence of oxygen or a source of oxygen at a temperature between 0° and 200° C. under conditions such that a 1,1'-bi-2-naphthol is prepared wherein the product contains less than about 1 mole percent of binaphthenoquinones.

4,496,774

COMPLEX FORMED TO SEPARATE NITRATED PHENOLIC COMPOUNDS FROM OTHER PHENOLIC COMPOUNDS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 582,083, Feb. 21, 1984, Pat. No. 4,469,901, which is a division of Ser. No. 431,640, Sep. 30, 1982, Pat. No. 4,497,654. This application Jul. 23, 1984, Ser. No. 633,717
Int. Cl.³ C07C *39/06*
U.S. Cl. 568—784 **1 Claim**

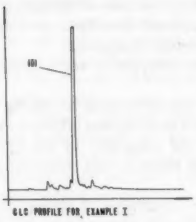
1. A complex consisting essentially of o-t-butylphenol and calcium bromide.

4,496,775

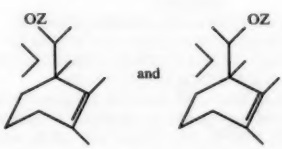
1,2,3,3,5,6-HEXAMETHYL-BICYCLO[2.2.2]-OCT-5-EN-2-OL, PROCESS FOR PRODUCING SAME, INTERMEDIATES USEFUL IN SAID PROCESS AND ORGANOLEPTIC USES OF SAME

William J. Evers, Locust; Braja D. Mookherjee, Holmdel; Anton Van Ouwerkerk, Livingston, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 535,800, Sep. 26, 1983, , which is a division of Ser. No. 371,930, Apr. 26, 1982, Pat. No. 4,434,085. This application Apr. 20, 1984, Ser. No. 602,581
Int. Cl.³ C07C *35/22*
U.S. Cl. 568—820 **4 Claims**



1. A compound defined according to a structure selected from the group consisting of:



wherein Z represents hydrogen, MgX or Li and X represents chloro, bromo or iodo.

4,496,776

EPOXIDE ISOMERIZATION PROCESS

Charles L. Edwards, and Stanley E. Wilson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 11, 1983, Ser. No. 522,130
Int. Cl.³ C07C *35/18*
U.S. Cl. 568—827 **12 Claims**

1. A process for the preparation of allylic alcohols which comprises isomerizing a di-, tri- or tetrahydrocarbyl-substituted epoxide in the presence of a metal alkoxide catalyst in which the metal is selected from early transition metals of Groups IVA and VA of the Periodic Table of Elements and in the absence of a solvent.

4,496,777

PRODUCTION OF HALOHYDRINS

George D. Suciu, Ridgewood; Joon T. Kwon, Freehold Township, Monmouth County, and Atef M. Shaban, Nutley, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Nov. 9, 1983, Ser. No. 549,891
Int. Cl.³ C07C *31/34, 31/36*
U.S. Cl. 568—850 **19 Claims**

1. A process for producing a chlorohydrin, comprising:
reacting an olefinically unsaturated compound with a tertiary alkyl hypohalite in the presence of water and at least one salt of an amphoteric metal which is dissolved in at least the water to provide a pH of from 2 to 5.

4,496,778

PROCESS FOR THE HYDROXYLATION OF OLEFINS USING MOLECULAR OXYGEN, AN OSMIUM CONTAINING CATALYST, A COPPER CO-CATALYST, AND AN AROMATIC AMINE BASED PROMOTER

Richard S. Myers, Fairlawn; Robert C. Michaelson, Waldwick, and Richard G. Austin, Ridgewood, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 3, 1983, Ser. No. 538,190
Int. Cl.³ C07C *29/04, 31/18, 31/22, 31/42*
U.S. Cl. 568—860 31 Claims

1. A process for hydroxylating at least one olefinic compound having at least one ethylenic unsaturation which comprises reacting said olefinic compound in the presence of oxygen, water and a catalyst composition, in a manner and under conditions sufficient to convert catalytically at least one of said ethylenic unsaturation directly to its corresponding diol, said catalyst composition comprising:

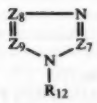
(a) at least one catalytically active osmium containing compound;

(b) at least one transition metal containing Co-catalyst I having an identity and in an amount effective to increase at least one of the rate and selectivity of the hydroxylation reaction relative to its absence, said transition metal being copper; and

(c) at least one Co-catalyst II having an identity and in an amount effective to increase the rate of the hydroxylation reaction relative to its absence and represented by at least one of the structural formulae:

(XIa)

or



(XIb)

wherein:

(1) in structural formula (XIa):

(a) Z_2 to Z_6 independently represent a member selected from the group consisting of a methylidyne group, a substituted methylidyne group represented, by the formula $=CR_{11}$, and a tertiary nitrogen group; said R_{11} substituent being selected from the group consisting of hydroxy, alkyl, aryl, aralkyl and alkaryl;

(b) any two of said R_{11} substituents located on adjacent carbons of said Z_2 to Z_5 groups of structural formula (XIa) together can constitute part of a monocyclic or fused bicyclic ring system, which partial ring systems are (i) aromatic, or heteroaromatic in nature, said heteroatom being nitrogen, and (ii) completed by, and fused with parent structure (XIa) through said adjacent carbons of Z_2 to Z_5 groups; and

(2) in structural formula (XIb):

(a) Z_7 to Z_9 independently represent a member selected from the group consisting of a methylidyne group, and a substituted methylidyne group represented by the formula $=CR'_{11}$ wherein R'_{11} is independently selected from the group consisting of alkyl, aryl, aralkyl, and alkaryl; and

(b) R_{12} is selected from the group consisting of alkyl, aryl, aralkyl, and alkaryl.

4,496,779

PROCESS FOR THE HYDROXYLATION OF OLEFINS USING MOLECULAR OXYGEN, AN OSMIUM CONTAINING CATALYST, A COPPER CO-CATALYST, AND A CYCLOALIPHATIC AMINE BASED PROMOTER

Richard S. Myers, Fairlawn; Robert C. Michaelson, Kinnelon, and Richard G. Austin, Ridgewood, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 26, 1984, Ser. No. 604,043
Int. Cl.³ C07C *29/04, 31/18, 31/22, 31/42*
U.S. Cl. 568—860 28 Claims

1. A process for hydroxylating at least one olefinic compound having at least one ethylenic unsaturation which comprises reacting said olefinic compound in the presence of oxygen, water and a catalyst composition, in a manner and under conditions sufficient to convert catalytically at least one of said ethylenic unsaturation directly to its corresponding diol, said catalyst composition comprising:

(a) at least one catalytically active osmium containing compound;

(b) at least one transition metal containing Co-catalyst I having an identity and in an amount effective to increase at least one of the rate and selectivity of the hydroxylation reaction relative to its absence, said transition metal being copper; and

(c) at least one Co-catalyst II selected from the group consisting of 1,4-diazabicyclo[2.2.2]octane and hexamethylenetetramine in an amount effective to increase the rate of the hydroxylation reaction relative to its absence.

4,496,780

HYDROCRACKING OF POLYOLS

Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 22, 1983, Ser. No. 507,198
Int. Cl.³ C07C *29/132, 31/20, 31/22*
U.S. Cl. 568—861 1 Claim

1. A process for hydrocracking sorbitol which comprises treating said sorbitol at a temperature in the range of from about 150° C. to about 250° C. and a pressure in the range of from about 500 to about 5000 pounds per square inch gauge in the presence of hydrogen and a catalyst system consisting essentially of from about 1% to about 10% by weight of ruthenium composited on a titanited alumina support and a separate co-catalyst consisting essentially of from about 5% to about 50% by weight barium oxide to produce and then recover the resultant glycerol, ethylene glycol and 1, 2-propanediol.

4,496,781

PROCESS FOR THE PRODUCTION OF ETHYLENE GLYCOL THROUGH THE HYDROFORMYLATION OF GLYCOL ALDEHYDE

Stephen E. Jacobson, Morristown, N.J., and Chun F. Chueh, Jamaica, N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Filed Apr. 5, 1984, Ser. No. 597,003
Int. Cl.³ C07C *31/20, 29/14*
U.S. Cl. 568—862 26 Claims

1. A process for the preparation of ethylene glycol through a glycol aldehyde intermediate comprising:

(A) reacting formaldehyde, hydrogen and carbon monoxide in a hydroformylation reaction zone to form glycol aldehyde in the presence of an effective solvent mixture comprising:

(1) a low boiling, polar, organic, hydroformylation solvent,

(2) a high boiling, non-polar organic solvent,

(3) a low boiling organic separation enhancing solvent;

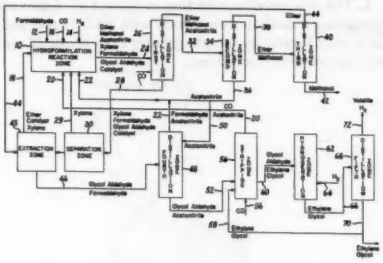
the reaction proceeding in the presence of a lipophilic catalyst selected from a class of phosphine-amide ligands in conjunction with an effective transition metal;

(B) separating the hydroformylation solvent and the separa-

tion enhancing solvent from the hydroformylation zone effluent;

(C) separating the glycol aldehyde-unreacted formaldehyde phase from the remaining reaction zone effluent, now comprising the high boiling, non-polar organic solvent containing the lipophilic catalyst;

(D) contacting and washing the separated glycol aldehyde-formaldehyde phase with the separation enhancing solvent in an extraction zone to substantially extract the



remaining high boiling, non-polar organic as well as any catalyst contained therein;

(E) recycling the separation enhancing solvent and the high boiling, non-polar organic solvent containing substantially all the lipophilic catalyst to the hydroformylation zone;

(F) separating the glycol aldehyde from the formaldehyde;

(G) hydrogenating the glycol aldehyde in a hydrogenation zone to ethylene glycol;

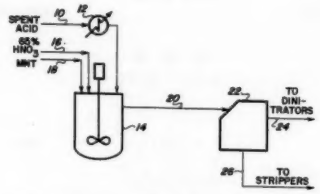
(H) separating ethylene glycol from the hydrogenation zone effluent.

4,496,782

NITRIC ACID RECOVERY BY THE ADIABATIC NITRATION OF NITROAROMATICS WITH FORTIFIED SPENT ACID

Richard V. C. Carr, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 8, 1983, Ser. No. 512,289
Int. Cl.³ C07C *79/10*
U.S. Cl. 568—934 **25 Claims**



1. A method for the recovery of nitric acid in the spent acid phase from a mixed acid mononitration reaction which comprises

(a) adding a sufficient amount of nitric acid to provide at least about 2 wt % nitric acid concentration in the spent acid phase from the mononitration reaction, and

(b) adiabatically reacting a mononitroaromatic hydrocarbon in greater than a stoichiometric amount with the nitric acid in the spent acid phase to afford a dinitroaromatic hydrocarbon product and a nitric acid concentration of less than about 0.25 wt % in the spent acid phase.

4,496,783

NITRATION OF ORGANIC COMPOUNDS AND ORGANIC NITROGEN COMPOUNDS PRODUCED

Ian M. Campbell; Donald L. Baulch, Leeds, and Gary J. Audley, Woking, all of England, assignors to Interox Chemicals Limited, United Kingdom

Filed Apr. 28, 1983, Ser. No. 489,467
Claims priority, application United Kingdom, May 1, 1982, 8212952
Int. Cl.³ C07C *79/02*
U.S. Cl. 568—947 **13 Claims**

1. In a process for the production of one or more organic nitro-compounds, organic nitrates or organic nitrites comprising reacting, in the vapour phase one or more organic compound with a nitrating agent, and recovering at least one resulting organic nitro-compound, organic nitrate or organic nitrite from the residual vapour phase, the improvement wherein radicals of the one or more organic compounds are produced for nitration by reacting hydrogen peroxide vapour and nitrogen dioxide in the presence of an acidic solid surface to produce hydroxyl radicals and reacting the hydroxyl radicals with a vapour of a reactive substrate mainly comprising the one or more organic compounds by forming a mixture containing the hydroxyl radicals and the vapour of the reactive substrate or containing hydrogen peroxide vapour and nitrogen dioxide, as hydroxyl radical precursors, in the presence of the solid surface, and the vapour of the reactive substrate whereby the radicals so produced are contacted with the nitrating agent.

4,496,784

HYDROCARBON CONVERSION PROCESS EMPLOYING CATALYSTS CONTAINING A MOLYBDENUM-EXCHANGED CRYSTALLINE ALUMINOSILICATE ZEOLITE

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 81,105, Oct. 2, 1979, Pat. No. 4,297,243. This application Jul. 20, 1981, Ser. No. 284,720
Int. Cl.³ C07C *4/12*
U.S. Cl. 585—486 **36 Claims**

1. In a process for dealkylating hydrocarbons, the improvement comprising contacting a hydrocarbon feedstock containing a component selected from the group consisting of toluene and alkylated naphthenes under dealkylating conditions with a catalyst comprising a molybdenum-containing zeolite prepared by calcining a crystalline aluminosilicate having at least some of its ion exchange capacity satisfied with cations containing molybdenum.

5. A hydrocarbon conversion process for upgrading hydrocarbons comprising contacting a hydrocarbon feedstock at an elevated temperature with a hydrocarbon conversion catalyst comprising a zeolite selected from the group consisting of calcined or sulfided crystalline aluminosilicate zeolites containing molybdenum-containing cations exchanged thereinto, said contacting being under conditions promoting the conversion of an acid catalyzed hydrocarbon conversion reaction.

4,496,785

PROCESS FOR REACTING ALCOHOLS AND OLEFINS

Jeffrey T. Miller, and Thomas D. Nevitt, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 28, 1983, Ser. No. 536,671
Int. Cl.³ C07C *1/22*
U.S. Cl. 585—640 **19 Claims**

1. A method for producing branched aliphatic hydrocarbons by reacting hydrogen with at least one of an alcohol containing from 1 to 6 carbons atoms and an olefin containing from 2 to 6 carbon atoms, at a temperature in the range of from about 300° C. to about 480° C., at a pressure in the range of from about 5 to about 150 kilograms per square centimeter, and in the presence of a catalyst composition comprising a cadmium compo-

nent and a support material having acidic properties, wherein the cadmium component is in the form of the elemental metal, its oxide or salt or a combination thereof, wherein the cadmium component is present at a concentration level in the range of from about 0.1 to about 20 weight percent, calculated as cadmium oxide and based on the weight of the catalyst, and wherein the support comprises an amorphous refractory inorganic oxide, a pillared smectite or vermiculite clay, a molecular sieve consisting essentially of unexchanged or cation-exchanged chabazite, clinoptilolite, zeolite A, zeolite L, zeolite X, zeolite Y, ultrastable zeolite Y, or crystalline borosilicate molecular sieve, or a combination thereof.

4,496,786

SELECTIVE CONVERSION OF METHANOL TO LOW MOLECULAR WEIGHT OLEFINS OVER HIGH SILICA SSZ-13 ZEOLITE

Donald S. Santilli, Novato, and Stacey I. Zones, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1983, Ser. No. 538,035

Int. Cl.[3] **C07C** *1/00*

U.S. Cl. 585—640 **3 Claims**

1. The process of converting methanol to olefins comprising contacting a methanol feedstock with SSZ-13 zeolite having an SiO_2/Al_2O_3 ratio by weight greater than about 20 under methanol conversion conditions.

4,496,787

METHOD AND DEVICE FOR COLLECTING AND EXPLOITING SOLAR RADIATION

Maurice Touchais, 1706 Chemin du Pioulier, 06140 Vence, and Madeleine Djelalian, 10 Impasse Abovian, 13015 Marseille, both of France

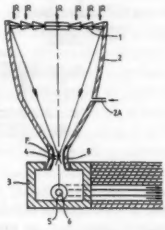
PCT No. PCT/FR82/00212, § 371 Date Aug. 16, 1983, § 102(e) Date Aug. 16, 1983, PCT Pub. No. WO83/02310, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 16, 1982, Ser. No. 536,158

Claims priority, application France, Dec. 23, 1981, 81 24103

Int. Cl.[3] H01L *31/04;* F24J *3/02*

U.S. Cl. 136—248 19 Claims



4. A device for collecting and maximally utilizing solar radiation comprising, in an intermediate space formed between a transparent covering and absorbent receiving surfaces of an insolator, an optical means which is thermally insulated and orientatable to track collimated radiation coming from the sun, said optical means selected from the optical devices of the catoptric and dioptric type permitting propagation of a beam of reflected radiations in the general direction of incident light, a positionally fixed thermally insulated enclosure having negative pressures therein for causing air other gas to flow thereinto receiving the incident light, said insolator located in said insulated enclosure, a thermal focus in said intermediate space being a focal point of the optical path of the radiation with said intermediate space having an opening of small diameter.

4,496,788

PHOTOVOLTAIC DEVICE

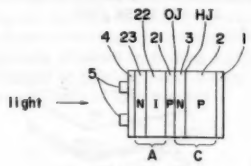
Yoshihiro Hamakawa; Hiroaki Okamoto, both of Kawanishi, and Kouji Okuda, Takatsuki, all of Japan, assignors to Osaka Transformer Co., Ltd., Osaka, Japan

Filed Sep. 2, 1983, Ser. No. 528,988

Claims priority, application Japan, Dec. 29, 1982, 57-234197; Mar. 24, 1983, 58-49318

Int. Cl.[3] H01L *31/06*

U.S. Cl. 136—249 35 Claims



1. A photovoltaic device which converts solar energy to electric energy, comprising, in combination:

a heterojunction solar cell comprising a crystalline semiconductor region and an amorphous or microcrystalline semiconductor region applied on said crystalline region with a p-n junction formed between said regions;

an amorphous solar cell tandemly applied on said heterojunction solar cell in optical and electrical series therewith, and comprising a p-type region, an i-type region and an n-type region of amorphous or microcrystalline semiconductor material applied in seriatim layers with a p-i-n junction formed between said regions, and

a p-n junction formed at the interface between said heterojunction solar cell and said amorphous solar cell.

4,496,789

INSULATING SPACER AND METAL SHEATH FOR GAS INSULATED ELECTRICAL EQUIPMENT

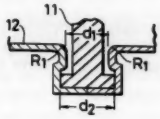
Koshi Itaka, and Takushi Hara, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 2, 1982, Ser. No. 446,108

Claims priority, application Japan, Dec. 2, 1981, 56-179969

Int. Cl.[3] H02G *5/06;* H01B *9/04*

U.S. Cl. 174—22 C 3 Claims



1. An insulating spacer and metal sheath assembly for gas insulated equipment comprising:

an insulating spacer having a portion of increased thickness relative to another portion thereof, a metal sheath having outwardly extending opposed flange surfaces which include confronting arcuate portions located adjacent the inner surface of the sheath, said spacer portion of increased thickness contacting and being held by said flange surfaces while not contacting said arcuate portions, the distance between said opposed flange surfaces being larger at an axially outside portion of said metal sheath than at an axially inside portion of said metal sheath; and said insulating spacer portion of increased thickness being brought into contact with said metal sheath on the outside portion of said metal sheath.

4,496,790

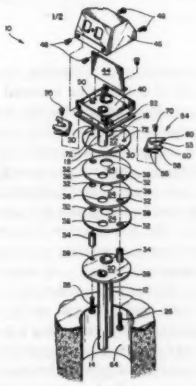
SELF-ANCHORING POKE-THRU WIRING DEVICE

David E. Spencer, Oxford, Ohio, assignor to Square D Company, Palatine, Ill.

Filed Mar. 18, 1983, Ser. No. 476,740

Int. Cl.[3] H02G *3/22*

U.S. Cl. 174—48 12 Claims



1. A self retaining wiring device for placement in a floor passage comprising:

an outlet box including a floor plate;

a wiring channel having one end disposed in said floor plate to facilitate extension of wire through said channel and into said outlet box and having an opposite end adapted to be received in a junction box;

sealing means for sealing said channel intermediate its opposite ends in response to a fire for preventing the spread of said fire through said floor passage;

a second plate surrounding said channel and associated in parallel planar relationship to said floor plate, said second plate having a periphery dimensioned to be received within said floor passage;

a plurality of generally V-shaped resilient members removably secured to said second plate, each resilient member having a base leg and a retaining leg;

securing means for removably securing said base leg to said second plate;

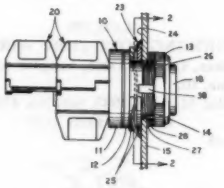
said retaining leg extending peripherally outward past the periphery of said second plate and having portions defining a notch providing a pair of barbs at its distal end.

4,496,791

SPRING-BIASED CONNECTOR FOR ELECTRICALLY BONDING A DEVICE TO A SUPPORTING WALL

Gilbert A. Reichert, Greendale, and Donald K. Schuette, Cedarburg, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 13, 1982, Ser. No. 434,040
Int. Cl.³ H05K *5/02*
U.S. Cl. 174—51 **4 Claims**



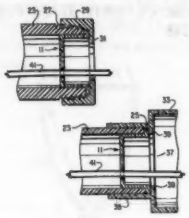
1. In a mounting assembly for mounting an electrical device on a supporting wall of conductive material and defining an aperture therein, a bushing of conductive material having a flanged portion positioned adjacent a first surface of said supporting wall and an integral stem portion extending through said aperture and defining a groove extending along the longitudinal axis of said stem portion, and fastening means engaging the stem portion of said bushing and the opposite surface of said supporting wall; the combination therewith of an apertured flat spring member surrounding and engaging the stem portion of said bushing and defining at least one laterally extending marginal area including an outer edge having a portion in abrasive contact with said first wall surface, said flat spring member including an inwardly extending tab portion slidably engaging the groove of said stem portion and further including a deflectable raised portion adapted to be compressed between said flanged portion and the first surface of said wall to cause the said marginal area to be forcibly extended outwardly with its outer edge portion biting into said wall to thereby complete an electrically bonded circuit between said bushing and said supporting wall.

4,496,792

ELECTRICAL CONDUIT WITH VAPOR BARRIER DEVICE

G. Russell Balkwill, 2429 Howard Ave., Windsor, Ontario, Canada (N8X 3V5); Jules P. Robinet, 2865 Virginia Pk., Windsor, Ontario, Canada N9E 2B8, and John F. Tamasovics, 2530 Todd La., Windsor, Ontario, Canada N9H 1K5

Filed Feb. 14, 1983, Ser. No. 466,043
Int. Cl.³ H02G *3/04, 3/18*
U.S. Cl. 174—65 R **3 Claims**



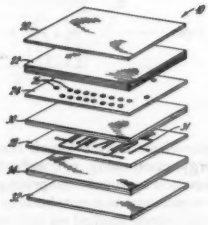
1. In combination, an electrical conduit having an outer surface of predetermined diameter, an inner surface of predetermined diameter, and an annular edge extending between the inner surface and the outer surface, a device for sealing the end of said conduit comprising a tubular portion having a closed end and an open end, said closed end having a plurality of areas of a thickness substantially less than the thickness of the remainder of said closed end, said areas being adapted to be punctured by and sealingly receive wires or cables, said tubular portion having an outer surface of a diameter such that said tubular portion outer surface sealingly engages the inner surface of said conduit, said open end having a flange extending outwardly therefrom with an outer diameter not exceeding the outer diameter of said conduit, said flange abutting said annular edge of said conduit, and a tubular member received over the outer surface of said conduit and having an inwardly extending flange engaging the flange of said device and pressing said device flange against the annular edge of said conduit.

4,496,793

MULTI-LAYER METAL CORE CIRCUIT BOARD LAMINATE WITH A CONTROLLED THERMAL COEFFICIENT OF EXPANSION

John R. Hanson, Richmond; James L. Hauser, Lenox; James F. Kilfeather, Jr., Pittsfield, and Hendrik B. Hendriks, Becket, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 162,827, Jun. 25, 1980, abandoned. This application Jan. 26, 1983, Ser. No. 461,061
Int. Cl.³ H05K *1/05*
U.S. Cl. 174—68.5 **11 Claims**



1. A multi-layer circuit board laminate having a controlled thermal coefficient of expansion for use with leadless components, said multi-layer circuit board comprising:

a plurality of planar layers bonded together in face-to-face contacting relationship to form a complete laminate structure, wherein at least two of said layers are thermal expansion stabilizing layers formed of a metal having a thermal coefficient of expansion selected to be equal to or less than the coefficient of thermal expansion of leadless circuit board components to be mounted on said board, said stabilizing layers being securely bonded in face-to-face contacting relationship with at least one other layer of said multi-layer circuit board so that said thermal expansion stabilizing layers control the thermal coefficient of expansion of the composite laminate structure.

11. A multi-layer circuit board laminate having a controlled thermal coefficient of expansion for use with leadless components, said multi-layer circuit board comprising:

a plurality of planar layers disposed in face-to-face contacting relationship and bonded together to form a composite laminate structure, wherein at least two of said layers are formed of a dielectric material; wherein at least another of said layers is a thermal expansion stabilizing layer formed of a metallic substance having a lower thermal coefficient of expansion than the dielectric layers; wherein said thermal expansion stabilizing layer contains at least one thru hole; and wherein at least one bonding layer is disposed adjacent to said thermal expansion stabilizing layer with said bonding layer consisting of at least one sheet of resin impregnated glass cloth to facilitate the intrusion of dielectric material into said thru hole in said thermal expansion stabilizing layer during lamination, whereby said thermal expansion stabilizing layer reduces the thermal coefficient of expansion of the composite laminate structure.

4,496,794

FLEXIBLE BASE MATERIALS, THEIR PREPARATION AND THEIR USE FOR PRINTED CIRCUITS

Roland Darms, Therwil; Harry Beyeler, Basel, and Theobald Haug, Frenkendorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Substitute for Ser. No. 531,590, Sep. 13, 1983, abandoned, which is a continuation of Ser. No. 422,423, Sep. 23, 1982, abandoned, which is a continuation of Ser. No. 298,964, Sep. 3, 1981, abandoned. This application Jun. 4, 1984, Ser. No. 617,821

Claims priority, application Switzerland, Sep. 15, 1980, 6903/80

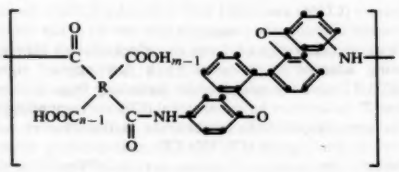
Int. Cl.³ H05K *1/00*

U.S. Cl. 174—68.5 **7 Claims**

1. A flexible, printed circuit with excellent adhesion of the printed circuit tracks, which is obtained by

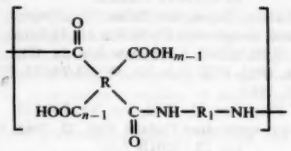
coating one side of a metal foil without any interlayer with a polymer consisting of a polyamide, polyamide-imide or polyimide, obtained by heating a polyamide, polyamide-amidoacid or polyimide-acid having 1 to 100 mol % of structural units of the formula I

(I)



and of 0 to 99 mol % of structural units of the formula II

(II)



in which the NH groups in formula I are, independently of one another, bonded to the o-, m- or p-position of the benzene nucleus and the individual symbols or radicals m, n, R and R_1, independently of one another, are defined as follows: m and n are each 1 or 2, R is a carbocyclic-aromatic or heterocyclic-aromatic radical, in which the carboxamide groups and carboxyl groups are bonded to different carbon atoms and the carboxyl groups, if R is a cyclic radical and at least one of m and n is 2, are each in the ortho-position to a carboxamide group, and R_1 is a carbocyclic-aromatic or heterocyclic-aromatic radical,

heating the coated metal foil in the temperature range from 50° to 350° C. till a track-free coating is obtained,

exposing the opposite side of the coated metal foil, which side is provided with a photolacquer, through a photo mask, and

developing the exposed metal foil.

4,496,795

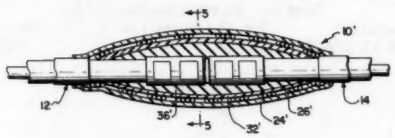
ELECTRICAL CABLE SPLICING SYSTEM

Robert P. Konnik, Seymour, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed May 16, 1984, Ser. No. 610,785

Int. Cl.³ B32B *15/00, 27/00;* H01R *4/00*

U.S. Cl. 174—84 R **18 Claims**



1. A splice assembly for insulated electrical cables, comprising:

a first cable having a first insulation layer surrounding a first conductor, said first conductor having a first exposed end extending from said first layer;

a second cable having a second insulation layer surrounding a second conductor, said second conductor having a second exposed end extending from said second layer;

connector means for electrically coupling said first and second exposed conductor ends;

a sealing layer of uncured insulation material surrounding said connector means and engaging said insulation layers;

barrier means, surrounding said sealing layer, for inhibiting flow of said sealing layer upon heating; and

an open mesh sleeve surrounding said barrier means having opposite axial ends rigidly secured to said first and second cables;

whereby, upon heating, said sealing layer seals the connected ends with said open mesh sleeve applying substantially uniform and constant pressure to said sealing layer between said axial ends during curing.

4,496,796
BUOYANT CABLE

Keijo E. Matikainen, Espoo, and Raimo M. Järvinen, Hyrylä, both of Finland, assignors to Oy Nokia Ab, Helsinki, Finland

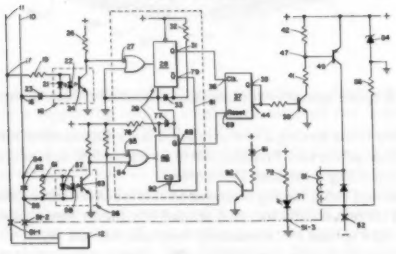
PCT No. PCT/FI82/00047, § 371 Date Jun. 21, 1983, § 102(e) Date Jun. 21, 1983, PCT Pub. No. WO83/01534, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 21, 1982, Ser. No. 514,822
Claims priority, application Finland, Oct. 23, 1981, 813332
Int. Cl.³ H01B 7/12
U.S. Cl. 174—101.5 6 Claims

1. A buoyant cable comprising:
(a) a conductor;
(b) a float for buoyantly supporting said conductor in water, said float being separate from said conductor; and
(c) a cable sheath having connected sheath portions for said conductor and said float, said cable sheath surrounding said conductor and said float in said connected sheath portions to form a buoyant cable wherein heat is transmitted from said conductor into surrounding water substantially without passing through said float.

4,496,797
CIRCUIT FOR AUTOMATICALLY CONNECTING AND DISCONNECTING A SPEAKERPHONE TO A TELEPHONE LINE

John W. Price, Millstadt, Ill., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,234
Int. Cl.³ H04M 1/64
U.S. Cl. 179—81 B 7 Claims

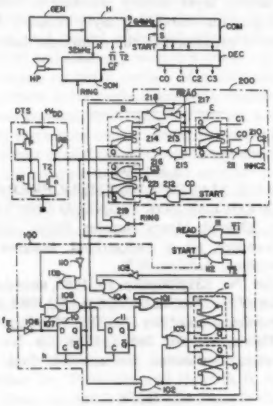


1. A circuit for connecting a telecommunication device to a subscriber telephone line, which comprises:
a first optical isolator connected across the telephone line for generating discrete pulses in response to A.C. ringing pulses;
a first one shot multivibrator having an input port responsive to each discrete pulse for generating a counting pulse at an output port;
a counter circuit connected to said multivibrator output port and responsive to a predetermined number of said counting pulses for generating a control pulse;
a normally unoperated relay having contacts in the telephone line for connecting the telecommunication device to the telephone line;
means responsive to said control pulse for operating said relay to connect the telecommunication device to the subscriber's telephone line;
a second optical isolator circuit having a pair of terminals connected in the subscriber's line and energized upon closure of said relay contacts for monitoring current flow in the telephone line;
a second one shot multivibrator having an input port connected to said second optical isolator and responsive to said optical isolator being deenergized in response to an interruption of current flow in the telephone line for generating a reset pulse; and
means for applying said reset pulse to reset said counter circuit to a zero count condition.

4,496,798
RINGING CIRCUIT FOR TELEPHONE SUBSET, DESIGNED AS AN INTEGRATED CIRCUIT

Joël S. G. Colardelle, Les Ulis; Claude P. H. Lerouge, Maurepas, and Nicole J. R. Loup, Vélizy-Villacoublay, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,544
Claims priority, application France, Aug. 17, 1982, 82 14205
Int. Cl.³ H04M 1/00
U.S. Cl. 179—84 T 8 Claims



1. A ringing circuit for a telephone set, designed as an integrated circuit, intended to furnish a signal at a chosen audio frequency to a loudspeaker when the ringing signal is present on the telephone line supplying the said telephone set, the said ringing circuit being powered by the said ringing signal suitably rectified, characterized in that the said ringing circuit comprises:
a clock circuit (H) furnishing various clock signals (h, T1, T2, h') from the signals of a stable oscillator (GEN);
a counter (COM) associated with a decoder (DEC), the said counter counting the pulses of a first one (h) of the various clock signals received from the clock circuit (H) and being adapted to be reset by a first control signal (START) and the said decoder furnishing from the content of the counter an initial signal (C0), corresponding to the appearance of the initial code in the counter, and various time signals (C1, C2, C3) corresponding respectively to the passage of various periods of time after the initial signal;
a ring generator (SON) furnishing, from a second one (h') of the various clock signals delivered by the clock circuit

(H), the said signal at audio frequency when it receives a second control signal (RING); and

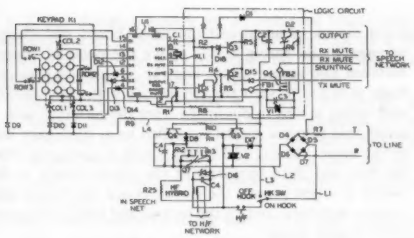
a ringing signal detection system (**100, 200**) containing a circuit (**100**) for detecting transitions in the same direction in the received ringing signal, circuit which furnishes the first control signal (START) and a third control signal (READ) at the moment each transition having the said direction appears, and a circuit (**200**) receiving the initial signal (**C0**) and the various time signals (**C1, C2, C3**) for measuring the elapsed time between two successive transitions, detected by the transition detection circuit (**100**), to determine if the ringing signal is present and to then furnish the said second control signal (RING) as long as it remains present.

4,496,799

HANDSFREE TELEPHONE INSTRUMENT USING DIGITAL DIAL

Rickey W. Kingen, Corinth, Miss., and Robert H. Duncan, Memphis, Tenn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 448,978
Int. Cl.³ H04M *9/08*
U.S. Cl. 179—100 L **12 Claims**



10. A handsfree telephone instrument coupled to a telephone line, said instrument including a digital dual tone multifrequency generator for transmission of selected tones to said line in response to operation of switches of a key pad, and in which said generator comprises an integrated circuit for the digital generation of said tones, a tone output network responsive to tones emitted by said generator for transmitting generated tones for transmission to said line, a first transistor coupled to said line for operation with said instrument in its handsfree mode for switching a handsfree network of said instrument across said line, a transistor network activated responsive to operation of any one of said switches for coupling said generator to said line to activate said generator, inverter means responsive to the activation of said transistor network for shutting off said first transistor, a muting resistor in series with said handsfree network of said instrument for muting tones of said handsfree network when said first transistor is shut off, said first transistor being operated on the termination of transmission of tones by said generator for shunting said muting resistor to switch said handsfree network across said telephone line for the bidirectional transfer of alternating current signals thereacross.

4,496,800

RINGING GENERATOR TESTING ARRANGEMENT FOR A DIGITAL TELEPHONE NETWORK

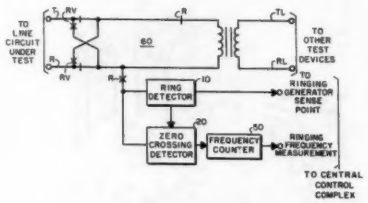
John S. Young, Scottsdale, Ariz., assignor to Gte Automatic Electric Inc., Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,742
Int. Cl.³ H04M *3/22*
U.S. Cl. 179—175.2 R **9 Claims**

1. An arrangement for measuring the frequency of a ringing generator, including a line circuit having a tip and a ring lead and a source of alternating current ringing generator signals under control of a central control complex, said arrangement comprising:

zero crossing detector means connected to said ring lead and arranged to produce a first output signal responsive to the negative to positive transition of said ringing generator signals and a second output signal responsive to the first positive to negative transition of said ringing generator signal;

clock signal generating means developing and producing a continuous output clock signal; and



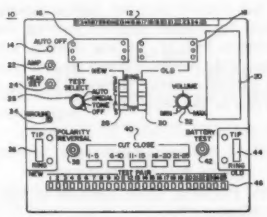
counting means connected to said zero crossing detector means and to said clock signal generating means and responsive to said zero crossing detector means first output signal, said counting means receives and counts said clock signals for a period until said zero crossing detector means second output signal, whereby responsive to said second output signal said counter transmits to said central control complex a count representing the measured interval of said ringing generator signal.

4,496,801

SPLICING MODULE TEST SET

Thomas P. Roberts, San Jose; Albert R. Howard, Sunnyvale, and James B. Hutchison, Mountain View, all of Calif., assignors to Western Progress, Inc., Sunnyvale, Calif.

Filed Oct. 12, 1982, Ser. No. 433,720
Int. Cl.³ H04B *3/46*
U.S. Cl. 179—175.3 R **13 Claims**



12. A splicing test set comprising first and second line pairs, each of said line pairs including tip and ring connections, means for connecting the respective tip and ring connections, means for loading said first line pairs with a predetermined resistance such as not to signal an off-hook condition, electronic means for automatically determining the correct connections of said second pair to said first pair,

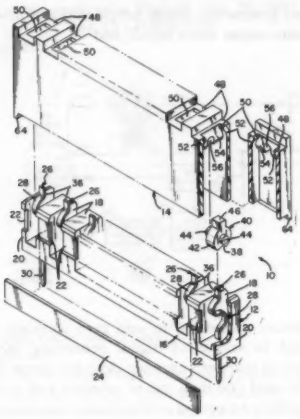
ohmmeter means for electrically isolating said first and second ring connections and said first and second tip connections for special circuit types of testing, means for generating control signals representing the electrical resistance of said respective connections, and

meter means responsive to said control signals for indicating the measured resistances.

4,496,802
SINGLE IN-LINE PACKAGE SWITCH

William H. Rose, and David T. Shaffer, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 15, 1983, Ser. No. 485,549
Int. Cl.[3] H01H 5/18
U.S. Cl. 200—5 R 12 Claims



1. An electrical switch of the type comprising a dielectric frame in which movable electrical contact members are mounted in actuating alignment with a stationary electrical contact member, actuating members in engagement with respective free ends of the movable contact members, and a housing member mounted on the dielectric frame, characterized in that:

each of said movable contact members has a reverse-curved contact section, the free end of said reverse-curved contact section disposed in a recess of a respective one of said actuating members;

said stationary electrical contact member mounted onto said dielectric frame and defining a bus contact member;

said actuating members when moved to one position moving the movable contact sections into electrical engagement with said bus contact member, said actuating members when moved to another position moving the movable contact sections free of the bus contact member, the spring forces of the reverse-curved contact sections maintaining the movable contact sections and actuating members in the one or the other position.

4,496,803
DATA ENTRY SWITCH

William D. Smith, Placentia, Calif., assignor to Key Concepts, Incorporated, Houston, Tex.

Filed May 4, 1983, Ser. No. 491,454
Int. Cl.[3] H01H 9/00, 13/50, 15/00
U.S. Cl. 200—5 A 6 Claims

5. A switch for selectively completing a circuit between terminals on a circuit board underlying a movable operator key such as in data entry keyboards or the like comprising:

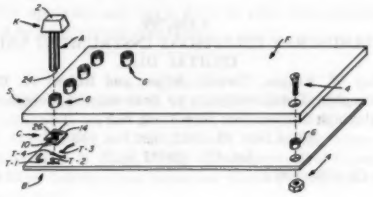
a contact spring body;

a first spring means for supporting said body above the circuit board, said first spring means depending from said body and extending therebelow to contact a first terminal on the circuit board;

a first contact member depending from said body and extending therebelow to overlay a second terminal on the circuit board when said switch is at rest and to contact the second terminal when said body is urged toward the circuit board thereby completing a first electrical circuit between the first terminal and second terminal of the circuit board via said contact spring body;

second spring means depending from said body and extending therebelow to contact a third terminal on the circuit board;

a second contact member depending from said body and extending therebelow to overlay a fourth terminal on the circuit board when said switch is at rest and to contact the fourth terminal when said body is urged toward the circuit board, thereby completing a second electrical circuit between the third and fourth terminals of the circuit board via said contact spring body;



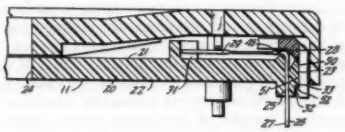
fulcrum means, mounted with the circuit board, and adapted to engage said spring means above the point of contact between said spring means and the circuit board as said body is urged toward the circuit board thereby causing said spring means to disengage from the terminal; and

wherein said fulcrum means is formed so as to engage said spring means causing said spring means to disengage from the first and third terminals of the circuit board as the switch is urged toward the circuit board and before said contact members contact the second and fourth terminals of the circuit board.

4,496,804
WIRE CONTACT RETENTION MEANS FOR ROTARY SWITCHES

Peter Hung, Huntington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Aug. 10, 1983, Ser. No. 521,697
Int. Cl.[3] H01H 19/58
U.S. Cl. 200—11 A 2 Claims

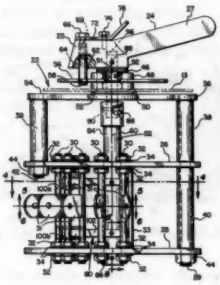


1. In a wire contact rotary type switch including a stator having a plurality of L-shaped wire contacts positioned in corresponding peripherally located bores, and a retaining ring engaged upon said stator at the periphery thereof to retain said contacts within said bores, the improvement comprising: said stator having a peripheral edge portion disposed outwardly of said bores defining a transversely extending shoulder, said retaining ring including a radially extending portion contacting said wire contacts and an axially extending peripheral portion defining a recess, said axially extending portion being radially expandable to enable it to be forced over said shoulder, and upon contraction to engage the same.

4,496,805
TRANSFORMER SWITCH

Clarence G. Duenke, San Angelo, Tex., assignor to Warco, Inc., Marthasville, Mo.

Filed Sep. 9, 1983, Ser. No. 530,867
Int. Cl.[3] H01H *19/58, 21/78*
U.S. Cl. 200—11 TC 17 Claims



1. A tap changing switch for an electrical transformer for connecting and disconnecting selected portions of a transformer winding under load to change the output supply voltage of said transformer, said switch comprising:

frame means for supporting a plurality of spaced apart contact elements, each of said contact elements including a terminal portion thereof disposed between opposite ends of said contact element for connecting said contact element to a conductor lead associated with a transformer winding;

rotary shaft means rotatably mounted on said frame means and connected to two spaced apart switch contactor means for engaging a selected pair of contact elements to close a circuit through said winding, said spaced apart contactor means being disposed on opposite sides of said terminal portions of said selected pair of contact elements, respectively, when engaged with said selected pair of contact elements so as to negate magnetic forces generated by current flow through said contact elements and said contactor means and acting on said contactor means during disengagement from said selected pair of contact elements.

9. A tap changing switch for an electrical transformer for connecting and disconnecting selected portions of a transformer winding under load to change the output supply voltage of said transformer, said switch comprising:

frame means for supporting a plurality of spaced apart contact elements, each of said contact elements including a terminal portion aligned with a corresponding terminal portion on every other contact element for connecting each of said contact elements to a conductor lead associated with a transformer winding;

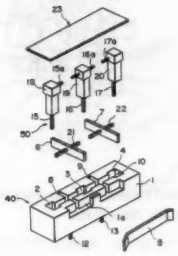
rotary shaft means rotatably mounted on said frame means and connected to switch contactor means for engaging a selected pair of contact elements to close a circuit through said winding;

said contactor means comprising first and second contactors spaced apart from each other on opposite sides of said terminal portions whereby current flowing to and from said contactors between said contact elements flows in opposite directions along portions of said contact elements, respectively, between said terminal portions of the respective contact elements to generate magnetic force fields acting on one of said contactors which are opposite to the magnetic force fields acting on the other of the contactors.

4,496,806
ELECTRIC CONTACT SWITCHING DEVICE

Kozo Maenishi; Masaaki Adachi, and Yoshihide Bando, all of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 343,832, Jan. 15, 1982, abandoned. This application Sep. 6, 1983, Ser. No. 529,723
Claims priority, application Japan, Jan. 30, 1981, 56-12972[U]; Jan. 30, 1981, 56-12973[U]; Aug. 28, 1981, 56-128204[U]
Int. Cl.[3] H01H *15/00, 9/00, 51/00;* H01P *1/10*
U.S. Cl. 200—16 R 20 Claims



1. An electric contact switching device which confines R-F within said device comprising in combination:

first external connecting means;

dielectric means for supporting said first external connecting means;

first conductor means having a switching contact member connected to said first external connecting means for switching a first connection with said switching contact member;

housing means for supporting and housing said first conductor means, and said dielectric means wherein said housing is constructed from a material which is an electrically conductive resin;

second external connecting means;

second conductor means connected to said second external connecting means; and

said second conductor means being in electrical contact with said housing means.

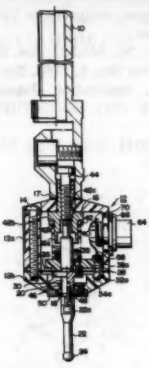
4,496,807
TOUCH SIGNAL PROBE

Hideo Sakata, Kawasaki, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 530,458
Claims priority, application Japan, Feb. 21, 1983, 58-24045[U]
Int. Cl.[3] H01H *3/16*
U.S. Cl. 200—61.42 4 Claims

1. A touch signal probe comprising a probe casing fixed to a shank body through a shank anchor, said probe casing containing a stylus shaft held for inclining relative to said probe casing, fixed contact means on the inner bottom of said probe casing, contact receiving means carrying movable contact means which is fixed to said stylus shaft and defines a set of contacts together with said fixed contact means, and spring means operably located between said shank anchor and said contact receiving means to urge said movable contact means toward said fixed contact means, whereby the displacement of said stylus shaft can be detected on the separation of said contact means, characterised in that said shank anchor slidably receives a spring seat having an engagement face engaged by said spring means at one end and in that an adjusting screw for forwardly and rearwardly moving said spring seat is threadedly screwed into said shank anchor, the tip of said adjusting screw engaging the opposite face from the engagement face of

said spring seat, whereby said spring means can be constricted or expanded to adjust a pressure of contact between said fixed



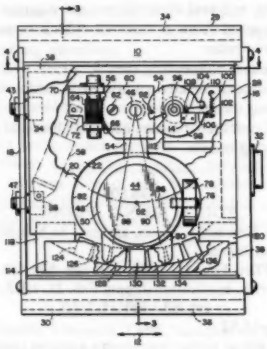
and movable contact means by moving said adjusting screw in either of the opposite directions.

4,496,808

ELECTRICAL SWITCH MECHANISM

Warren R. Alexander, Pittsford, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Dec. 29, 1982, Ser. No. 454,126
Int. Cl.³ H01H *35/02*
U.S. Cl. 200—61.45 R **11 Claims**



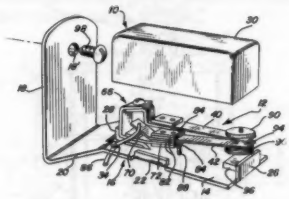
1. A switch mechanism for detecting acceleration or deceleration events which comprises a pendulum having a mass pivotally movable about a first axis and defining a first arm of a first lever between the center of gravity thereof and said first axis, means rotatable about said first axis defining a second arm of said first lever shorter than said first arm to provide a mechanical advantage, an electrical switch, means coupling said switch and second arm in force transfer relationship to enhance the sensitivity of said switch to the acceleration or deceleration of said pendulum mass, and further comprising eddy current damping means operatively associated with said pendulum and including a vane of conductive material movable with said pendulum along a path, and means for providing magnetic flux transverse to said path which alternates in direction along said path.

4,496,809

VIBRATION SENSITIVE TRIP SWITCH FOR VEHICLE ALARM SYSTEM OF THE LIKE

James H. Faust, Scottsdale, Ariz., and Michael J. Borch, Roselle, Ill., assignors to A B C Auto Alarms, Inc., Elk Grove Village, Ill.

Filed Oct. 17, 1983, Ser. No. 542,735
Int. Cl.³ H01H *35/02*
U.S. Cl. 200—61.45 R **25 Claims**



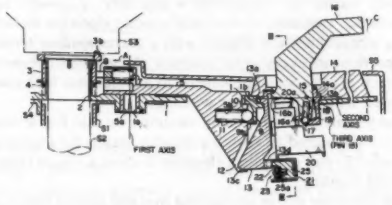
23. A vibrationally responsive electrical trip switch for a vehicle alarm system, said trip switch comprising a pair of overlying, cantilever mounted, angularly related, thin, flat, unequally weighted, springs spaced apart, first and second juxtaposed spaced mounting arms, means securing said springs to said arms at adjacent respective ends for directing said springs in respective first and second planes with their free ends disposed spaced a precise distance, said second plane being below and canted toward said first plane, electrical contact means secured to facing surfaces of said first and second springs defining a precise gap therebetween, means for establishing electrical connection to at least one of said springs by way of one of said arms, the heavier weighted spring functioning only as a motion detector and the lighter weighted spring functioning only as a shock detector.

4,496,810

COLUMN MOUNTED SWITCHING DEVICE FOR AUTOMOBILES

Masaru Suzuki, Aichi; Masayosi Iwata; Yoshikazu Hayashi, both of Gifu, and Tadashi Yokoyama, Mie, all of Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Apr. 4, 1983, Ser. No. 481,787
Claims priority, application Japan, Apr. 7, 1982, 57-51019[U]
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—61.54 **16 Claims**



1. A column mounted switching device for automobiles mounted on a steering column, comprising:

(a) a base plate mounted on the steering column;

(b) a turn bracket pivotally supported on the base plate about a first axis parallel to the axis of the steering column;

(c) operating means rotatably supported on the base plate about a second axis substantially to a right angle to the first axis, said operating means having a first portion pro-

jected from a surface of the turn bracket upwardly and a second portion connected to a portion of the turn bracket, whereby when the operating means rotates about the second axis, the turn bracket being able to pivot about the first axis through the portion of the turn bracket;

(d) a turn-signal switch operated by the rotation of the operating means about the second axis;

(e) a self-cancelling mechanism disposed between the turn bracket and a steering shaft and returning the turn bracket and the operating means back to a neutral position at the time of the rotation of a steering wheel;

(f) a push buttom arranged close to the first portion of the operating means and on the same plane of the first portion; and

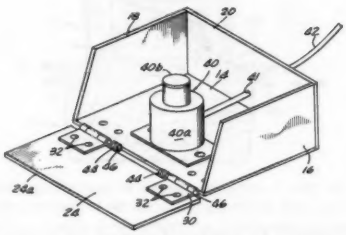
(g) a hazard switch switched on or off by the repeated push operation of the push button.

4,496,811

FOOT SWITCH SAFETY ENCLOSURE

Lawrence F. Irwin, 12860 San Fernando Rd., Sylmar, Calif. 91342

Filed Apr. 15, 1983, Ser. No. 485,263
Int. Cl.³ H01H *3/14*
U.S. Cl. 200—86.5 **6 Claims**



1. A foot operated safety enclosure in combination with a foot operated switch comprising:

(a) a housing for partially enclosing the switch including:

(1) a base member for supporting the switch; and

(2) generally upstanding front, rear and side walls connected to said base, said walls extending above the uppermost part of the switch with one of said walls being inwardly sloping and pivotally movable relative to said base member for movement by the foot of the user from a first normally upstanding position to a second lowered position in response to a rearward and downward force being exerted on the upper edge thereof whereby as said pivotally movable wall is moved into said second lowered position the foot of the user will move downwardly into operable engagement with the switch; and

(b) biasing means for yieldably resisting movement of said one of said walls from said first to said second position.

4,496,812

MEMBRANE PANEL

Joseph L. Carley; James S. Potter, both of Millville, and Anthony A. Ciccotelli, Eldora, all of N.J., assignors to Duralith Corporation, Millville, N.J.

Filed Jan. 6, 1983, Ser. No. 456,242
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—159 B **6 Claims**

1. A membrane panel comprising:

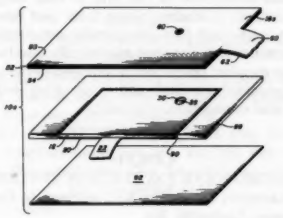
A. a rigid support member having substantially planar top and bottom surfaces, and including at least one void region extending from said bottom surface,

B. A flexible top member including at least one flexible layer overlaying said support member, and

C. a flexible bottom member including a flexible layer underlying said support member and said bottom member having its upper surface affixed to the bottom surface of said support member, and said bottom member including an integral flexible tail extending therefrom,

wherein said bottom member further includes at least one electrical component affixed to said upper surface, said component underlying and extending into an associated one of said void regions, and

wherein said bottom member further includes an electrically conductive pattern affixed to said upper surface and means for electrically coupling said pattern to said components and further comprising:



a rigid spacer member having its top surface affixed to the underside of said top member, said spacer member including a void region extending from one edge thereof and underlying said top member,

a base member affixed to the lower surface of said spacer member and underlying the void region defined by said spacer member,

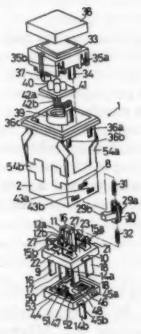
wherein said void region defined by said spacer member has a shape adapted to permit said support member and bottom members to be selectively inserted therein and withdrawn therefrom.

4,496,813

ILLUMINATION TYPE PUSH BUTTON SWITCH

Toshitsugi Fukushima, Tokyo, Japan, assignor to Sun Dengyosha Company, Limited, Tokyo, Japan

Filed May 4, 1983, Ser. No. 491,535
Claims priority, application Japan, Nov. 18, 1982, 57-201128
Int. Cl.³ H01H *9/16*
U.S. Cl. 200—314 **4 Claims**



1. An illumination type push button switch comprising;

a casing;

a light emitting diode having connection terminals, inside said casing;

a planar base plate detachably supported in a said casing;

an integrated electronic circuit including at least one light

emitting diode protective resistor formed in a plane on said base plate;

a pair of external terminals on said base plate; and

means, mounted in said casing, for electrically connecting said light emitting diode to an electric power source through said external terminals and said integrated electronic circuit with said integrated electronic circuit interposed between said external terminals and said light emitting diode, one of said pair of external terminals being electrically connected to said integrated electronic circuit, said connecting means including a first electrically conductive terminal keep member connected to one of said connection terminals an electrically conductive connection plate connected at one end to said integrated electronic circuit, extending away from said base plate into contact with said fuel electrically conductive terminal keep member and a second electrically conductive terminal keep member connected at one end to the other of said pair of external terminals and at the other end to another one of said connection terminals.

4,496,814

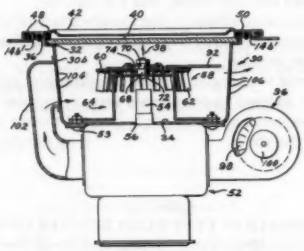
MICROWAVE EXCITATION SYSTEM

Louis H. Fitzmayer, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 10, 1983, Ser. No. 457,038

Int. Cl.³ H05B 6/70

U.S. Cl. 219—10.55 F **20 Claims**



1. A microwave excitation system comprising:

a waveguide open at one end for propagating microwave energy therethrough along a centrally extending propagation axis, the other end thereof being terminated by a conductive end wall having an aperture formed therein centrally of said waveguide;

a magnetron for generating microwave energy having an output probe, said output probe extending axially into said waveguide through said aperture in said end wall to excite a predetermined propagating mode in said waveguide;

a generally cup-like member disposed within said waveguide inverted over said probe, said cup-like member being electrically insulated from said waveguide and operative to capacitively couple microwave energy from said magnetron to said waveguide, said cup-like member being dimensioned to provide a matched load condition for said magnetron.

4,496,815

MICROWAVE BROWNING UTENSIL

Jorgen A. Jorgensen, Bloomington, Minn., assignor to Northland Aluminum Products, Inc., Minneapolis, Minn.

Filed Jan. 14, 1983, Ser. No. 458,171

Int. Cl.³ H05B 6/64

U.S. Cl. 219—10.55 E **8 Claims**

1. A cooking utensil for use in a microwave oven environment which comprises a metal platter having a top surface suitable for holding a food product to be cooked and having a bottom surface, a continuous layer of ferritic material of generally uniform thickness bonded to the bottom surface of the metal platter, an air and moisture proof layer of organic material of high molecular weight covering completely the layer of ferritic material and extending therebeyond onto said bottom

surface of said metal platter, and a housing of microwave transmissive material extending beneath and to the sides of the metal platter in supporting contact with the platter solely about the periphery of said platter.

4,496,816

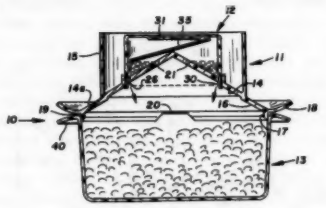
MICROWAVE APPLIANCE FOR POPPING POPCORN

George McNamara, Minneapolis, Minn., assignor to Leisure Technology, Inc., Minneapolis, Minn.

Filed May 4, 1983, Ser. No. 491,361

Int. Cl.³ H05B 9/06

U.S. Cl. 219—10.55 E **8 Claims**



1. An appliance for popping of popcorn and simultaneously heating butter or margarine to be applied thereto after popping, such appliance including:

a. kernel receiving portion providing a generally conical inner, kernel receiving surface and a generally outer conical surface;

b. a support member extending from said outer surface for support of the appliance;

c. a cover member having a predetermined dimension to receive the popped kernels of corn therein and normally covering said kernel receiving portion during the popping of the kernels of corn;

d. a receptacle underlying and removably attached to said kernel receiving portion arranged and constructed to receive and retain a predetermined quantity of a meltable flavoring substance;

e. attachment means for removably attaching said receptacle against said outer surface of said kernel receiving portion; and,

f. said attachment means including flow passages to define flow paths for the flow of flavoring substance from said receptacle to the inner portion of said kernel receiving portion onto the popped kernels of corn when the appliance is inverted.

4,496,817

AUTOMATIC FIRE DETECTION FOR A MICROWAVE OVEN

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 7, 1983, Ser. No. 511,556

Int. Cl.³ H05B 6/68

U.S. Cl. 219—10.55 M **7 Claims**

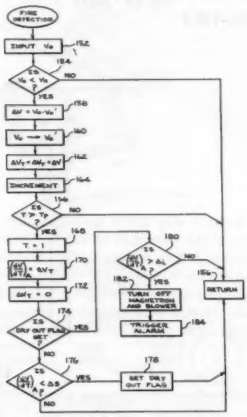
1. A method of anticipating a fire condition in the cooking cavity of a microwave oven of the type having means for

continuously circulating air through the cavity to remove gaseous emissions from the food being heated in the cavity and sensor means for sensing the concentration of such gases in the circulating air, said method comprising the steps of:

circulating air through the cavity to remove therefrom gases emitted from the food load being heated in the cavity;

sensing the concentration level of such gases in the circulating air;

periodically determining the rate of change of concentration level;



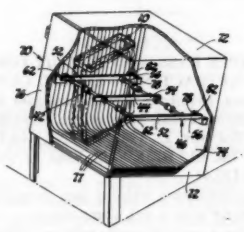
monitoring the rate of change to detect a rate of change characteristic of the temperature of the food load in the cavity closely approaching its combustion temperature including the steps of detecting a first relatively slow rate of change indicative of the load having been cooked to its drying out stage and thereafter detecting a second relatively rapid rate of change, detection of said second rate following said first rate being indicative of closely approaching the combustion temperature of the load; and having detected said second rate of change, turning off power to the oven.

4,496,818

SUPPORT FOR INDUCTION HEATED WORKPIECES

Michael G. Reynolds, Utica, Mich., and Craig E. Brittin, Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 12, 1984, Ser. No. 570,194
Int. Cl.³ H05B 6/10
U.S. Cl. 219—10.57 **4 Claims**



1. In an induction heating system for heating an assembly of elongated vertical and horizontal parts within a chamber utilizing a magnetic field disposed at an angle to the vertical and horizontal planes, means for supporting the assembly within the chamber comprising

a generally rectangular steel frame including a pair of support rods,

means for supporting the frame within the chamber with the plane of the frame parallel to the magnetic field to minimize inductive heating of the frame, and

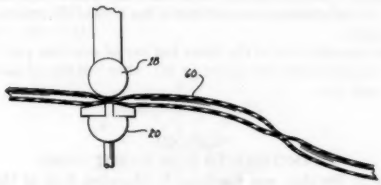
a pair of elongated fixtures for gripping opposite sides of the assembly, and recess means in each fixture for cooperatively engaging a support rod to support the assembly within the chamber.

4,496,819

JAWS FOR AN ELECTRO-MECHANICAL TUBING SEALER

Loren C. Acker, Tucson; Junius E. Taylor, Tempe, and Stephen C. Minney, Tucson, all of Ariz., assignors to Engineering and Research Associates, Inc., Tucson, Ariz.

Division of Ser. No. 334,749, Dec. 28, 1981, Pat. No. 4,390,832, which is a continuation of Ser. No. 122,293, Feb. 19, 1980, abandoned. This application Dec. 14, 1982, Ser. No. 449,619
Int. Cl.³ H05B 6/54
U.S. Cl. 219—10.81 **7 Claims**



1. A pair of jaws for clamping and welding plastic tubing placed therebetween on energization of a source of high frequency electromagnetic energy electrically connected to said pair of jaws, said pair of jaws comprising in combination:

(a) a fixed jaw;

(b) a movable jaw for clamping the tubing placed between said pair of jaws, said movable jaw including a ridge having a surface for contacting the tubing; and

(c) means attached to said movable jaw for elongating a section of the tubing placed between said pair of jaws on clamping of the tubing and on energization of the source of high frequency electromagnetic energy, said elongating means including a pair of wedges having faces extending laterally from opposed edges of said ridge surface and away from said fixed jaw.

4,496,820

MULTISPOT ELECTRICAL RESISTANCE WELDING MACHINE

Gerhard Ritter; Klaus Ritter, both of Graz, and Gerhard Jahrbacher, Peggau, all of Austria, assignors to Evg Entwicklungs- und Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed Dec. 5, 1983, Ser. No. 558,163
Claims priority, application Austria, Dec. 14, 1982, 4539/82
Int. Cl.³ B23K 9/28
U.S. Cl. 219—87 **14 Claims**

1. An electric multispot resistance welding machine, for example, one particularly suited for the production of welded wire mesh, in which pulses of welding current are fed from a transformer-fed rectifier unit, by way of busbars, to a plurality of welding electrodes defining a welding plane,

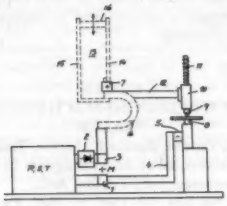
comprising, in combination,

said bus bars, including a first pair of bus bars, each disposed substantially parallel to the other and at opposite sides of said welding plane, each welding electrode being adapted

to be conductively connected to one of said bus bars of said first pair,

a second pair of bus bars, arranged along a longitudinal axis of symmetry, and substantially parallel to the bus bars of said first pair,

each bus bar of the first pair being spaced apart for the same distance from said axis of said second pair,



a set of rectifier units, each terminal of said rectifier units being conductively connected to one of said bus bars of said second pair,

one end of one said bus bar of said first pair being conductively connected to one of said bus bars of the second pair, and

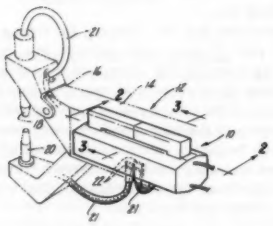
the opposite end of the other bus bar of said first pair being conductively connected to the other bus bar of said second pair.

4,496,821

TRANSFORMER FOR ROBOT ARMS

Peter H. Burgher, and Raymond F. Marsden, both of Howell, Mich., assignors to Marelco Power Systems, Inc., Howell, Mich.

Filed Aug. 6, 1982, Ser. No. 405,987
Int. Cl.³ B23K *11/24;* H01F *27/02*
U.S. Cl. 219—116 **6 Claims**



5. In combination with a robotic welder having a single arm, positive and negative welding electrodes mounted at one end of said arm, and means for controlling movement of said arm including an electric power source, the improvement comprising a transformer mounted to said arm adjacent to said end,

wherein said transformer comprises;

a core having two substantially C-shaped portions, each portion having first and second shanks extending in a parallel relationship from a base leg, the ends of said first and second shanks of one portion abutting against the ends of said first and second shanks, respectively, of the other portion, to form a closed loop core;

a secondary winding wrapped around said first shanks of said core portions;

a primary winding coaxially wrapped about said secondary winding substantially the same length as said secondary winding;

a coating of electrically insulating material encapsulating said windings and said first shanks of said core section; and

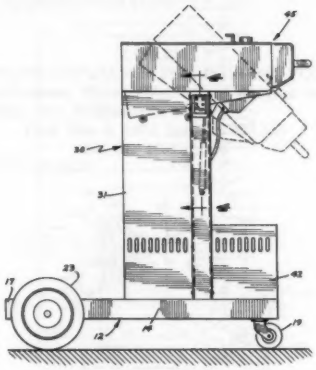
wherein said secondary winding comprises a monolithic, single turn winding.

4,496,822

TILTING RELEASING LATCH STRUCTURE FOR WELDING MACHINE WELDING HEAD

Viktor J. Jegers, Bloomington, and Duncan T. Lasley, Minneapolis, both of Minn., assignors to Century Mfg. Co., Minneapolis, Minn.

Filed Jul. 11, 1983, Ser. No. 512,484
Int. Cl.³ B23K *37/02*
U.S. Cl. 219—125.1 **3 Claims**



1. In a welding machine including a housing and a demountable welding head disposed thereon, a tilting releasing latch structure, having in combination

a welding machine housing,

a demountable welding head disposed upon said housing,

a supporting member for said welding head carried by said housing,

said supporting member comprising a back wall and a pair of side walls, said walls having inwardly angled flanges having said welding head disposed thereon,

a pair of opposite plate members depending from said flanges of said side walls,

side walls portions of said housing adjacent said plate members each having an arcuate slot therein,

a piston member carried by said housing on each of said side wall portions adjacent said slots, and at the other side of said walls from that of said plate members,

means respectively connecting the extendible portions of said piston members to said plate members through said arcuate slots,

whereby movement of said means through said slots in one direction tilts said welding head.

4,496,823

MULTIPLE PASSAGE CONDUIT FOR FUME EXTRACTING WELDING GUN

Robert N. Mann, Etobicoke, Canada, assignor to Bob Mann & Associates Incorporated, Mississauga, Canada

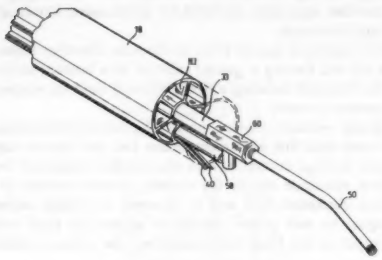
Filed Nov. 22, 1982, Ser. No. 443,175
Int. Cl.³ B23K *9/32;* F16L *11/04*
U.S. Cl. 219—137.41 **8 Claims**

1. In a fume extracting welding gun through which a consumable electrode wire is fed, comprising:

a head portion, a control handle portion, a flexible connector portion, means for removing fumes from the weld site, means for conducting the consumable electrode wire to said head portion, means for conducting shielding gas to said head portion, and means for conducting electricity to

the electrode wire at said head portion, the improvement wherein:

said flexible connector portion comprises an integrally-formed flexible hose comprising an outer housing defining a hollow interior and having a smooth outer surface and an inner surface and a plurality of longitudinally-extending baffles located in and coextensive with the hollow



interior said baffles being integrally formed with and joined to each other and to the inner surface to define a plurality of separate passageways and extending through said flexible hose for conveying said fumes from said head portion, and additional separate passageways for conducting the consumable electrode wire and the electricity to the head portion and for conducting shielding gas to the head portion.

4,496,824

METHOD FOR CONTROLLING TEMPERATURE OF HEAT GENERATING ELEMENT OF THERMAL PRINTING HEAD AND CIRCUIT FOR PRACTISING SAME

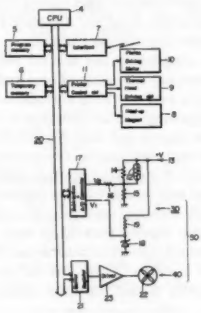
Hirokazu Kawai, and Fumio Takahashi, both of Ise, Japan, assignors to Shinko Electric Co., Ltd. and Kanzaki Paper Mfg., Co., Ltd., both of Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,993

Claims priority, application Japan, Mar. 18, 1982, 57-43195

Int. Cl.[3] **B41J** *3/20*

U.S. Cl. 219—216 **4 Claims**



1. A thermal printer of the type in which heat-dissolving ink is thermally transferred onto a paper on a platen surface by heat generating elements of a print head, said thermal printer comprising:

(a) temperature detecting means for detecting the temperature of said print head to generate a heat detection signal;

(b) means for generating first and second threshold signals, said first and second threshold signals respectively representing upper and lower-limits of a desired temperature range of said print head;

(c) comparator means for comparing said heat detection signal with both of said first and second threshold signals, said comparator means generating a first control signal when said heat detection signal is greater than said first threshold signal, said comparator means generating a second control signal when said heat detection signal is less than said second threshold signal;

(d) control means responsive to said second control signal for halting normal printing operation of said thermal printer;

(e) lifting means responsive to said second control signal for lifting said print head up so that said print head is spaced from said paper;

(f) energizing means responsive to said second control signal for feeding electric power to all of said heat generating elements; and

(g) cooling means responsive to said first control signal for cooling said print head.

4,496,825

ELECTRIC CURLING IRON HAVING A REMOVABLE HAIR GROOMING ATTACHMENT

Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Continuation-in-part of Ser. No. 59,676, Jul. 23, 1979, abandoned. This application Sep. 7, 1982, Ser. No. 415,372

Int. Cl.[3] **A45D** *2/36;* **A46D** *7/10;* **H05B** *1/00*

U.S. Cl. 219—222 **12 Claims**

5. A hair curling iron comprising a handle, an elongated heating element attached to said handle and having an outer peripheral surface and a first end adjacent to said handle and a second end projecting outwardly from said handle, means for defining a plurality of generally arcuately spaced grooves extending longitudinally on said outer peripheral surface of said heating element between said first end and said second end, and being axially open at said second end, and a separable hair grooming attachment slideably removable on said heating element, said attachment comprising an annular frame including a plurality of arcuately spaced, longitudinally extending, support bars slidingly engaged in said grooves, and hair grooming means on said frame.

4,496,826

HAND-HELD SHOCK-RESISTANT ELECTROLYTICALLY HEATED STEAM PRODUCING APPARATUS

Leonard Osrow, 180 S. Middleneck Rd., Great Neck, N.Y. 11021

Filed Feb. 14, 1983, Ser. No. 466,216

Int. Cl.[3] **H05B** *3/60, 1/02;* **D06F** *75/16;* **F22B** *1/30*

U.S. Cl. 219—272 **12 Claims**

1. A hand-held, steam-producing apparatus, comprising:

(a) a hollow housing including a top wall, a bottom wall and a pair of side walls together bounding an interior, said housing having a partitioning wall extending between the top and bottom walls and subdividing the interior into two compartments, said top wall having a water-filling openable inlet which, when opened, provides fluid communication with one of the compartments, said bottom wall

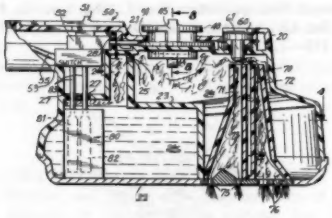
having a steam outlet port in fluid communication with said one compartment, said partitioning wall having an open communicating passage extending between the compartments for providing fluid communication therebetween;

(b) a hollow tubular steam stack in said one compartment and extending from the steam outlet port in the bottom wall towards the top wall and terminating short of the latter to form a steam inlet port at an elevation, as considered with respect to the bottom wall, which is lower than that of the communicating passage of the partitioning wall;

(c) a handle on the housing for permitting a user to manipulate the apparatus among

(i) a filling position in which the top wall is situated above the bottom wall to permit water to enter said one compartment via the opened water-filling inlet of the top wall,

(ii) a transfer position in which said one compartment is situated above the other of the compartments to permit the water received in said one compartment to be transferred to said other compartment via the open communicating passage, and



(iii) an up-ended position in which said other compartment is situated above said one compartment;

(d) a pair of spaced-apart, energizable electrodes located in said other compartment, and means for selectively energizing the electrodes upon application of different electric potentials thereto to electrolytically generate steam by the passage of electric current between the energized electrodes and through the water transferred to said other compartment; and

(e) means for preventing the formation of an electrically conductive path through water between the energized electrodes and the user in the filling, transfer and up-ended positions, said preventing means including a water-inpervious, electrically-insulating section of the partitioning wall, said section extending away from the electrodes and bounding a recess in said other compartment to constitute a part thereof, said recess having a capacity sufficient to retentively receive substantially the entire water contents of said other compartment in the up-ended position, and to maintain said entire water contents out of electrolytic contact with the energized electrodes in the up-ended position.

4,496,827

ENHANCED HEAT AND MASS TRANSFER APPARATUS

Eugene J. Sturdevant, Wilmington, Del., assignor to Proctor-Silex, Inc., Chillicothe, Ohio

Filed Apr. 25, 1983, Ser. No. 488,556
Int. Cl.³ F28F *13/16*
U.S. Cl. 219—399 **12 Claims**

1. An apparatus in a food cooking device for enhancing heat and mass transfer between surfaces of food being cooked and ambient air contained within a heat chamber during the cooking process of the cooking device, the apparatus comprising in combination;

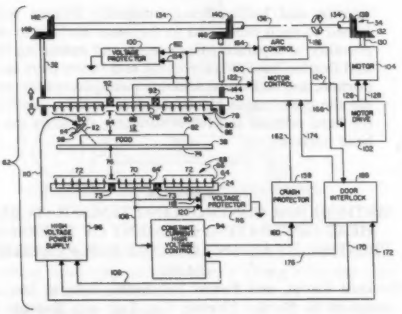
a food supporting member fixedly mounted in electrical isolation in the heat chamber;

a variable high voltage power supply having at least a high potential output terminal;

an electrical conducting means including a food engagement member electrically connected to said high potential terminal, said high voltage power supply operable to supply high voltage to the food through said food engagement member engaging the food for maintaining the food at a high potential;

a first electrode means fixed in the heat chamber below the food and having a spaced relation to a bottom surface of the food for defining a first electrical field for supporting corona current;

a circuit voltage control means electrically interposed between said first electrode means and said power supply, said voltage control means electrically connected to said first electrode means for sensing corona current in said first electrical field and to generate a voltage adjusting signal to said power supply to adjust the high voltage output to the food for maintaining the corona current in



said first electrical field at a constant optimum corona current density within a range from 15 $\mu A/in^2$ to 35 $\mu A/in^2$ for enhancing heat and mass transfer at said bottom food surface;

a second electrode means movably supported above the food in the heat chamber and having a spaced relation to a top surface of the food for defining a second electrical field for supporting corona current;

a drive means coupled to the second electrode means for adjustively moving said second electrode means towards and away from said top food surface; and

an electrode adjusting circuit interposed between said second electrode means and said drive means, said electrode adjusting circuit electrically connected to said second electrode means for sensing corona current in said second electrical field and to electrically control the drive means for adjustively moving said second electrode means for maintaining the corona current in said second electrical field at a constant optimum corona current density within a range from 5 $\mu A/in^2$ to 25 $\mu A/in^2$ for enhancing heat and mass transfer at said top food surface.

4,496,828

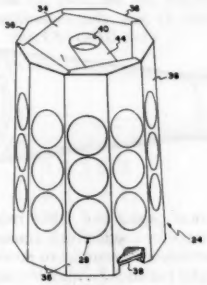
SUSCEPTOR ASSEMBLY

Marvin A. Kusmierz, and Robert F. Pijaszek, both of Bay City, Mich., assignors to Ultra Carbon Corporation, Bay City, Mich.

Filed Jul. 8, 1983, Ser. No. 511,859
Int. Cl.³ C23C *13/08*; H05B *1/00*
U.S. Cl. 219—405 **20 Claims**

1. A susceptor assembly for supporting a plurality of disc-like substrates for high temperature vapor deposition, said assembly comprising geometrically similar top and bottom

plates of graphite having upper and lower surfaces and side edges defining outer peripheries; means for supporting said top plate in a horizontal position in symmetrical relationship to a central vertical axis, a plurality of vertically elongate graphite side plates having interior and exterior side surfaces and upper and lower ends, first means for suspending said side plates from said top plate around the outer periphery thereof, said side plates each having a first longitudinal side edge and a second



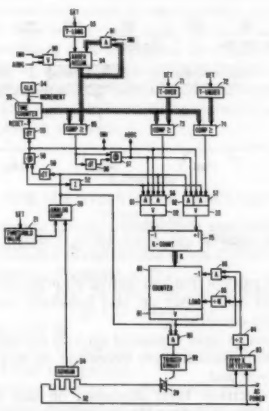
opposed longitudinal side edge of a configuration complementary to said first side edge such that when said side plates are all suspended from said top plate, the first side edge of each side plate is in face to face contact with the second side edge of an adjacent side plate whereby said side plates define an enclosure with an interior, surrounding said central axis, means supporting said bottom plate within the interior of said enclosure, and means on said side plates for mounting a plurality of substrates on the exterior side surface thereof.

4,496,829

BANG-BANG DUAL-MODE INTEGRAL CONTROLLER WITH PROPORTIONAL CONTROL OUTPUT USEFUL FOR TEMPERATURE CONTROL

Arthur G. Black, Boulder; John H. Dodge, Thornton, and Larry M. Ernst, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,661
Int. Cl.³ H05B 1/02
U.S. Cl. 219—497 **6 Claims**



1. A method of controlling an output signal as a function of time passage between events comprising the steps of:

setting predetermined upper and lower time limits;

supplying a proportional output signal determinative of a controlled variable;

generating a reference signal after the value of the controlled variable crosses a predetermined threshold value;

measuring the time period between successively generated reference signals;

increasing the proportion of said output signal if the measured time period that the value of said controlled variable is below said threshold value is not less than said lower time limit; and

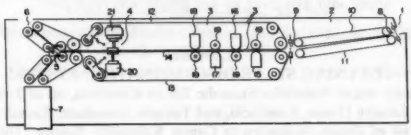
decreasing the proportion of said output signal if the measured time period that the value of the controlled variable is above said threshold value is greater than said upper time limit.

4,496,830

TICKET CHECKING APPARATUS

Setsuo Yoshihara, Ebina; Yorihumi Otsubo, and Takashi Kobayashi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 7, 1982, Ser. No. 386,084
Claims priority, application Japan, Jun. 10, 1981, 56-88244
Int. Cl.³ G06K 7/10
U.S. Cl. 235—458 **7 Claims**



1. A ticket checking apparatus comprising: a ticket signal generator for producing a ticket signal corresponding to a shape of a ticket;

means for extracting signal components corresponding to at least one manually punched portion on the peripheral edge of said ticket or at least one automatically punched hole in a predetermined position thereof from a ticket signal derived from said ticket signal generator and for judging as to whether said ticket is valid or invalid on the basis of said signal components.

4,496,831

PORTABLE LASER SCANNING SYSTEM AND SCANNING METHODS

Jerome Swartz; Edward Barkan, both of Long Island City, and Shelley A. Harrison, Dix Hills, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Division of Ser. No. 125,768, Feb. 29, 1980, Pat. No. 4,387,297.
This application Nov. 16, 1981, Ser. No. 321,934
Int. Cl.³ G06K 7/10
U.S. Cl. 235—472 **24 Claims**

1. A light-weight, high-speed, miniature scanning device for repetitively scanning light, comprising:

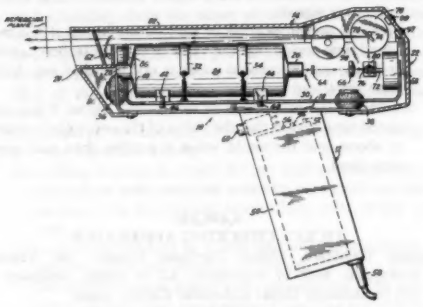
(a) a scanning motor having a stator, a rotor, and an elongated shaft operatively connected to the rotor for joint movement about an axis which extends along the elongation of the shaft;

(b) light-reflecting means mounted on the shaft for joint movement;

(c) means for magnetically generating a centering force which acts on the rotor to urge the shaft and light-reflecting means to a center position, said magnetically-generating means including means for establishing at the stator and the rotor respective magnetic fields which interact to cause the magnetic field of the rotor to align itself with the magnetic field of the stator; and

(d) motor control means for repetitively driving the shaft and light-reflecting means thereon in alternate circumfer-

ential directions about said axis to respective scan positions angularly spaced from said center position, said motor control means including means for electromagnetically moving the rotor against the action of the centering



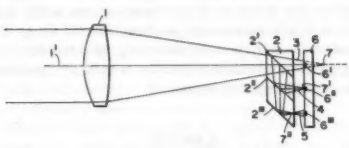
force in one circumferential direction about said axis over an arc length less than 360°, and thereupon for electromagnetically moving the rotor against the action of the centering force in the opposite circumferential direction about said axis over an arc length less than 360°.

4,496,832

FOCUSING STATE DISCRIMINATING SYSTEM

Shinji Sakai; Nobuhiko Shinoda; Takao Kinoshita, all of Tokyo; Kazuya Hosoe, Kunitachi, and Takashi Kawabata, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,373
Claims priority, application Japan, Oct. 16, 1980, 55/144782
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—201 **6 Claims**



1. A system for discriminating a focusing state of imaging lens means with respect to an object, comprising:

(A) means for generating signals F1, F2 and F3 associated with image formation states of images of the object formed by said imaging lens means at first, second and third positions substantially corresponding to positions slightly in front of, coincident with and behind a predetermined focal plane of said imaging lens means; and

(B) means for discriminating the focusing states of said images formed by said imaging lens means, based on the signals generated from said signal generating means, said discriminating means performs, as an operation for discrimination, at least a comparison of |F1−F3| and K1(F1+F2+F3), where K1 is a constant.

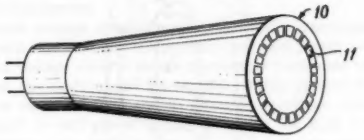
4,496,833

DETECTION PROCESS AND APPARATUS

Ludwig Wesch, Alter Weg 18, Glücksburg-Meierwik, Fed. Rep. of Germany

Division of Ser. No. 67,855, Nov. 7, 1960,. This application Jan. 26, 1965, Ser. No. 428,255
Int. Cl.³ H01J *40/14;* **G01J** *1/00;* **H01J** *40/00*
U.S. Cl. 250—211 R **1 Claim**

1. Apparatus for locating a target which radiates or reflects electromagnetic energy comprising a circular-scan cathode-ray tube including a screen and an electron beam moving over said screen, regions of said screen fluorescing when impinged upon by said electron beam to generate light energy, a plurality of semi-conductor elements disposed on said screen, each of said semi-conductor elements including a layer of photoconductive material adjacent said screen and a layer of photo-dielectric material on said layer of photoconductive material and adapted to receive electromagnetic energy from said target, said photoconductive material having a low resistance only when receiving light energy, said photo-dielectric material



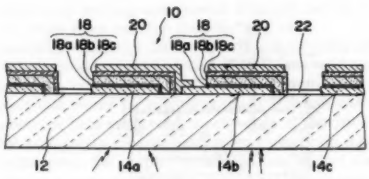
changing electrical capacitance when receiving electromagnetic energy, means for conductively connecting together said layers of photoconductive material to provide a first terminal, an electromagnetic radiation permeable conductor disposed on all other said layers of photo-dielectric material and including a second terminal, and an oscillator means including a tuned circuit connected to said first and second terminals, said oscillator means transmitting a target indicating signal when the layer of photo-dielectric material of one of said semi-conductor elements receives electromagnetic energy simultaneously with the receipt of light energy by its associated layer of photoconductive material.

4,496,834

FOCUS DETECTING PHOTOELECTRIC DEVICE AND FOCUS DETECTING SYSTEM

Yasuhiro Nanba, Sennan; Takayuki Gotoh, Minamikawachi; Eiji Yamakawa, and Toshihiko Karasaki, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 6, 1982, Ser. No. 366,080
Claims priority, application Japan, Apr. 7, 1981, 56-52561
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—211 R **33 Claims**



1. A focus detecting photoelectric device comprising:

a substrate formed by an electrically non-conductive material;

a plurality of pairs of first and second photodiodes deposited adjacent to each other on said substrate, each of said photodiodes comprising:

a first electrode layer deposited directly on said substrate;

an amorphous silicon layer deposited on said first electrode layer; and

a second electrode layer deposited on said amorphous silicon layer such that the amorphous silicon layer is sandwiched between said first and second electrode layers, said first and second photodiodes in each pair being connected in series to each other; and

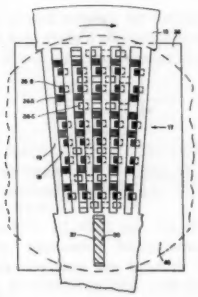
either said second electrode layer or a combination of said first electrode layer and said substrate being formed by transparent material for permitting impingement of light onto said amorphous silicon layer.

4,496,835

SHAFT ENCODER WITH DIFFUSELY PLACED LIGHT SENSITIVE ELEMENTS

Marcello Boella, Loranzè, and Paolo Rivera, Strambino, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jun. 15, 1982, Ser. No. 388,699
Claims priority, application Italy, Jun. 15, 1981, 67821 A/81
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—231 SE **13 Claims**



1. In an optical transducer for detecting the position of a movable member with respect to a fixed structure, comprising light emitting means for generating a light beam; photodetector means associated with said light emitting means and disposed in a region illuminated by said beam for detecting light of said beam and generating an electrical signal proportional to the detected light; and a shutter member interposed between said light emitting means and said photodetector means, and provided with a plurality of light interrupting zones separated by light transmitting zones, each one of said light transmitting zones having predetermined width and height for defining a predetermined light transmitting area; the improvement wherein said photodetector means comprises a plurality of light sensitive elements each one having a light sensitive area which is smaller than the light transmitting area of each one of said light transmitting zones for individually detecting a portion of said light beam, said light sensitive elements being diffusely distributed over the region illuminated by said light beam, and being electrically connected together in order to generate said electrical signal as result of the sum of the plurality of electrical signals individually generated by each one of said light sensitive elements.

4,496,836

DEVICE FOR IDENTIFYING A CIRCUMFERENTIAL POSITION

Charles R. Mikesell, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1982, Ser. No. 393,285
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—231 R **7 Claims**

1. A device for identifying a circumferential position on a non-vertical pipe comprising:

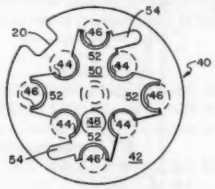
a wall member defining a substantially polyhedral chamber,

a light source external to said chamber and transmitting a beam of light therethrough,

a light-activated switch positioned to detect said light beam transmitted through said chamber,

an object internal to said chamber and freely moving therein subject to gravity,

means for mounting said device to revolve about the axis of said pipe, whereby as said device revolves to a predetermined circumferential position said internal object moves within said chamber and interrupts said light beam, said interruption triggering said light-activated switch to indicate such circumferential position of said device.

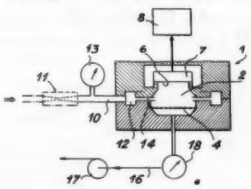


4,496,837

PRESSURE REDUCING DEVICE

Jean Charuau, Orsay, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 19, 1982, Ser. No. 399,263
Claims priority, application France, Jul. 24, 1981, 81 14430
Int. Cl.³ G01T *1/161, 1/18*
U.S. Cl. 250—303 **7 Claims**



1. An apparatus for detecting an aerosol for α-ray emitting solid particles, comprising:

means defining a measuring chamber;

a sampling filter in said measuring chamber;

a radiation detector in said measuring chamber;

outlet means communicating with said measuring chamber;

an aerosol source;

inlet means communicating said aerosol source with said measuring chamber;

a venturi tube in said inlet means; and

means for causing said aerosol to flow through said venturi tube at or near the speed of sound, whereby a fluid flow force of said aerosol reduces adherence of particles of said aerosol on walls of said venturi tube.

4,496,838

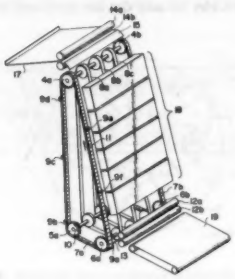
NOISE ERASING APPARATUS FOR STIMULABLE PHOSPHOR SHEET

Chiyuki Umemoto, and Kazuo Kohketsu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,983
Claims priority, application Japan, Nov. 13, 1981, 56-181832
Int. Cl.³ G03C *5/16*
U.S. Cl. 250—327.2 **15 Claims**

1. A noise erasing apparatus for a stimulable phosphor sheet, which comprises an erasing light source emitting light mainly having a wavelength within the range of 400nm to 600nm, a loading means for carrying the stimulable phosphor sheet to the position facing said erasing light source, a holding means

for holding said stimulable phosphor sheet in the position facing said erasing light source, and an unloading means for



carrying said stimulable phosphor sheet out of the position facing said erasing light source.

4,496,839

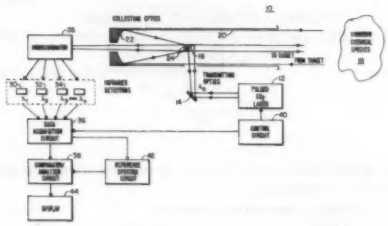
SYSTEM AND METHOD FOR REMOTE DETECTION AND IDENTIFICATION OF CHEMICAL SPECIES BY LASER INITIATED NONRESONANT INFRARED SPECTROSCOPY

Lawrence S. Bernstein, Bedford; Fritz Bien, Billerica, both of Mass., and John A. Jamieson, Chevy Chase, Md., assignors to Spectral Sciences Incorporated, Burlington, Mass.

Filed Nov. 3, 1982, Ser. No. 439,071

Int. Cl.³ G01J *3/00*

U.S. Cl. 250—341 **17 Claims**



1. A system for remote detection and identification of molecular species by laser initiated nonresonant infrared spectroscopy, comprising:

an infrared pulsed laser source for providing radiation of a first wavelength;

means for directing radiation at said first wavelength from said laser source to a remote mass of an unknown molecular species, which absorbs said radiation at said first wavelength to induce molecular excitation therein and emits nonresonant infrared radiation at one or more other wavelength regions, each said laser pulse having a duration less than the vibrational quenching time of said molecular species;

means for receiving infrared radiation from said mass of unknown molecular species;

means, responsive to said means for receiving, for detecting the intensity of the received infrared radiation;

means for sampling the intensity of the received infrared radiation after molecular excitation during the period of enhanced emission before relaxation, to obtain a nonresonant emission spectrum characteristic of said unknown molecular species; and

means for comparing said characteristic of said unknown molecular species with the characteristics of known molecular species for determining the identity of the unknown molecular species.

4,496,840

NONDISPERSIVE INFRARED GAS ANALYZER

Walter Fabinski, Hattersheim, and Udo Deptolla, Ober-Olm, both of Fed. Rep. of Germany, assignors to Hartmann & Braun AG, Frankfurt, Fed. Rep. of Germany

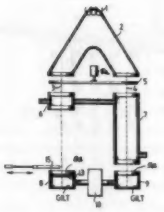
Filed Aug. 3, 1981, Ser. No. 289,184

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030002

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—343 **9 Claims**



1. Nondispersive infrared gas analyzer which includes a particular component in a host gas, the host gas including at least one component having one or more infrared absorption bands which overlap an infrared absorption band of the particular component, the analyzer including:

(a) a measuring beam path and a reference beam path without a reference gas and means for providing infrared radiation beams of the same frequency band to the two paths,

(b) a modulating means for the beams,

(c) a first, relatively short, cell being passed through by the gas to be analyzed and being disposed in one of said paths,

(d) a second, relatively long, cell being also passed through by the gas to be analyzed and being disposed in another one of said paths,

the improvement comprising in combination: a pair of substantially similarly configured receiver cells disposed respectively in said paths and being filled with the gas of said particular component, there being differential pressure-sensing means coupled to the receiver cells and producing a signal representative of the concentration of the particular component in the host gas; and

a plurality of thin rod or wire elements having a black surface and low heat capacity, and being disposed inside one of the receiver cells being disposed in the path that includes the relatively short cell.

4,496,841

RADIATION DETECTOR WITH RESONANT FREQUENCY TRANSLATOR

Dennis H. Pritzkow, New Berlin, and Robert M. Vavrek, Waukesha, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Apr. 1, 1983, Ser. No. 481,420

Int. Cl.³ G03B *41/16*; G01T *1/185*

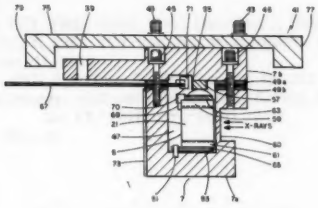
U.S. Cl. 250—374 **15 Claims**

1. A radiation detector comprising:

a housing;

detector means supported within said housing for detecting ionizing radiation admitted into said housing and providing in response thereto a plurality of electrical signals lying within a band of frequencies, said detector means

and said housing being jointly resonant at a predetermined frequency; and



means secured to said housing for modifying said resonant frequency so as to place it substantially outside the band of frequencies of said electrical signals to avoid interference therewith.

4,496,842

RADIATION DETECTOR

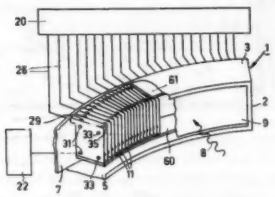
Joannes L. G. Hermens, and Matheus W. Kerkhof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,406

Claims priority, application Netherlands, Nov. 26, 1981, 8105349

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—385 **17 Claims**



1. A radiation detector comprising a plurality of separated plates, said plates having apertures, and intermediate spacers between each of said plates for separating said plates, said spacers contacting one another through said apertures.

4,496,843

METHOD FOR PRODUCING METAL IONS

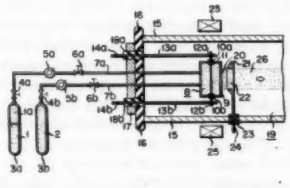
Kei Kirita, and Katuo Koike, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 27, 1982, Ser. No. 382,777

Claims priority, application Japan, Jun. 1, 1981, 56-82517

Int. Cl.³ H01J *27/00*

U.S. Cl. 250—426 **11 Claims**



1. A method for producing metal ions, comprising the steps of:

(a) producing an organic metal compound vapor by evaporation of a liquid organic metal compound;

(b) introducing said organic metal compound vapor and an auxiliary gas for cleaning an ionization chamber into said ionization chamber; and

(c) producing the metal ions by decomposing said organic metal compound vapor by ionization in a discharge.

4,496,844

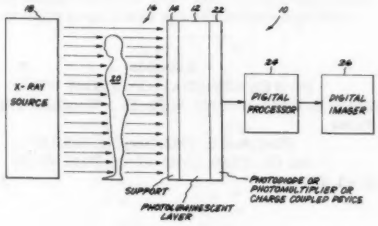
PHOTOLUMINESCENT PHOSPHORS AND X-RAY IMAGING SYSTEMS UTILIZING SUCH PHOSPHORS

John F. Ackerman, Cheyenne, Wyo., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1983, Ser. No. 528,830

Int. Cl.³ G21K *4/00*; C09K *11/24, 11/12*

U.S. Cl. 250—483.1 **21 Claims**



1. A radiographic imaging system, comprising:

(a) a photoluminescent layer including a phosphor of the general formula:

$$A_2MX_6$$

wherein

A is Cs, Rb, K or Na;

M is Ti, Zr, Hf, Te or Sn; and

X is Cl or Br;

said phosphor being sufficiently deficient of luminescent activators effective only at temperatures below about 77° kelvin that said phosphor exhibits luminescence at temperatures greater than about 77° kelvin;

(b) an X-ray source adapted to expose said photoluminescent layer to X-rays passing through an object and to thereby stimulate emission of a light image from said layer; and

(c) photodetection means to read the light image from said photoluminescent layer.

4,496,845

METHOD AND APPARATUS FOR CONTROL OF A TURBINE GENERATOR

Harold W. Ensign, Fullerton, and Donald G. Griswold, Corona del Mar, both of Calif., assignors to CLA-VAL Co., Costa Mesa, Calif.

Filed Dec. 27, 1982, Ser. No. 453,453

Int. Cl.³ F03B *13/00*

U.S. Cl. 290—43 **23 Claims**

1. In combination with a water system in which water flows from a supply at relatively high pressure to a water receiving system at relatively low pressure, a controlled power generating system comprising

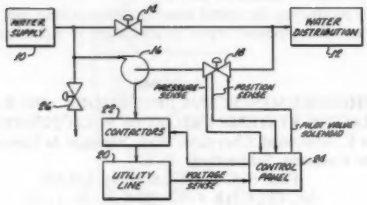
a turbine connected in a flow path between said supply and receiving system,

an electrical generator connected to be driven by said turbine,

a control valve operable between closed and open positions for controlling flow through said turbine,

contactor means operable between closed and open conditions for coupling said generator to a power circuit,

start means for operating said contactor means to closed condition and for initiating operation of said control valve to open position, and



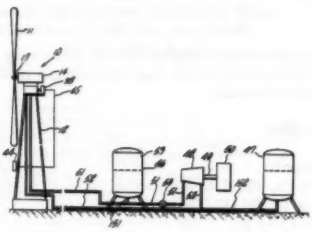
means responsive to said valve for disabling said start means when said control valve is in said open position.

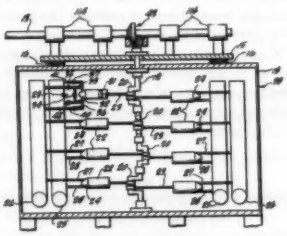
4,496,846

POWER GENERATION FROM WIND

William E. Parkins, 20120 Wells Dr., Woodland Hills, Calif. 91364

Filed Jun. 4, 1982, Ser. No. 385,330
Int. Cl.³ F03D *17/02, 49/02;* **F04B** *49/00*
U.S. Cl. 290—44 **33 Claims**





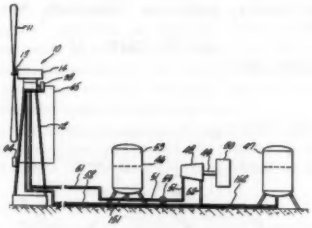
1. Apparatus for regulating the rotation of a wind responsive rotor of a wind machine comprising rotatable shaft means driven by a rotor thereby to be rotatable in response to wind action on the rotor, the shaft means being adapted to activate multistage pump means, each stage having intake means coupling a fluid intake line with the stage and discharge means coupling a fluid discharge line with the stage, selected stages having idling means communicating with said selected stage and either the fluid intake line or the fluid discharge line, and constricting means located in series with said selected stages between the intake line and discharge line, control means to regulate controllably the operative positions of the idling means and constricting means to change the pumping status of selected stages effectively pumping fluid between the intake line and discharge line while fluid passes into and from the selected stage thereby to vary controllably the torque on said shaft for a given shaft power transmitted thereby to permit regulation of the rotor rotational speed.

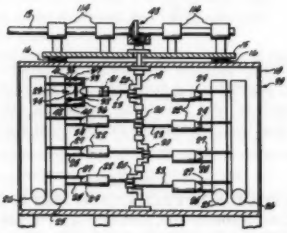
4,496,847

POWER GENERATION FROM WIND

William E. Parkins, 20120 Wells Dr., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 385,330, Jun. 4, 1982,. This application Dec. 16, 1982, Ser. No. 450,462
Int. Cl.³ F03D *17/02, 49/02;* **F04B** *49/00*
U.S. Cl. 290—44 **32 Claims**



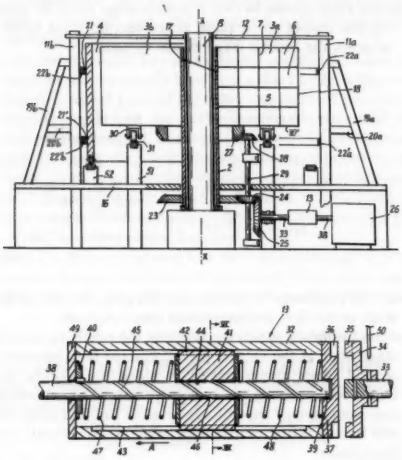


1. Apparatus for regulating the rotation of a wind responsive rotor of a wind machine comprising rotatable shaft means driven by a rotor thereby to be rotatable in response to wind action on the rotor, the shaft means being adapted to activate multistage pump means, each stage having intake means coupling a common fluid intake line with the stage and disharge means coupling a common fluid discharge line with the stage, first constricting means located in the common discharge line from the stages, control means to regulate controllably the operative positions of the intake means or discharge means on selected stages and the first constricting means thereby to change the pumping status of the stages effectively pumping fluid between the intake line and discharge line, fluid being adapted to pass into and from all the selected stages thereby to vary controllably the torque on said shaft for a given shaft power transmitted thereby to permit regulation of the rotor rotational speed.

4,496,848
DEVICE FOR HARNESSING WIND ENERGY INCLUDING SHOCK ABSORBER

Adam Binder, 52, Rue de la Tour d'Auvergne, 75009 Paris, France

PCT No. PCT/FR82/00081, § 371 Date Jan. 5, 1983, § 102(e) Date Jan. 5, 1983, PCT Pub. No. WO82/03893, PCT Pub. Date Nov. 11, 1982
PCT Filed May 7, 1982, Ser. No. 456,052
Claims priority, application France, May 8, 1981, 81 09183
Int. Cl.[3] F01D 5/14; F04D 29/38
U.S. Cl. 290—55 3 Claims

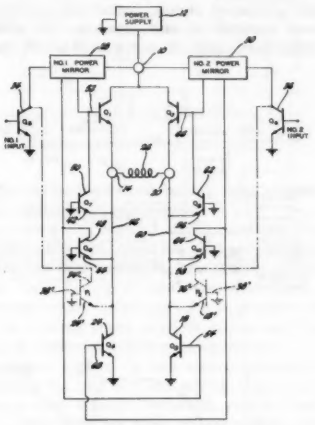


1. A device for harnessing energy from wind comprising:
a central generator including a rotor and at least two blades elongated axially in a vertical position, said blades being oriented radially in a horizontal plane and having an active surface area and further including means for harnessing kinetic energy, said active surface area including cells for engulfing air currents;
means for masking said blades when their displacement is in a direction opposite to a direction of said wind;
means for supporting said generator; and
shock absorber means comprising;
a first shaft;
rigid cylindrical cover rigidly coupled to set first shaft for transmitting energy to said generator;
said cover having a longitudinal groove on an inside surface thereof;
second shaft having first and second ends, rotatably disposed at said first end inside said cover and coaxially therewith, said second end being coupled to said generator, said shaft further including at least one helical groove thereon, which groove progresses on turning in the direction of rotation of said cover towards said second end;
cylindrical cursor having first and second ends, said cursor being longitudinally slideable in said cover, and having at least one rib, said cursor being coupled to said cover when said cover rotates by said at least one rib which circulates in said longitudinal grooves, said cursor further having a diameter substantially equal to said diameter of said second shaft, said second shaft passing there through and having at least one helical rib in correspondence to said helical groove; and
first and second springs located in said cover and coupled between said first and second cursor sides and said first and second ends of said cover respectively.

4,496,849
POWER TRANSISTOR PROTECTION FROM SUBSTRATE INJECTION

Thomas W. Kotowski, Norlesville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1982, Ser. No. 350,757
Int. Cl.[3] H01L 27/06; H02M 1/18; H03K 17/66
U.S. Cl. 307—254 5 Claims



1. In a PN junction-isolated bipolar integrated circuit having three mutually spaced isolation regions respectively forming the collectors of a power transistor, a driver transistor for the power transistor, and another transistor whose collector is subject to unwanted polarity reversal, which reversal could produce parasitic substrate injection of current collectible by the driver transistor collector that, in turn, could produce unwanted drive current for the power transistor, the improvement comprising a fourth isolation pocket disposed between the driver transistor pocket and the other transistor pocket, the fourth isolation pocket not containing any opposite conductivity type regions, and a low resistance electrical connection between the fourth isolation pocket and a base region of the power transistor that is the only electrical contact formed on the pocket, effective both to reduce the parasitic substrate injection from the other transistor to the driver transistor and to negate parasitic base drive to the power transistor when the unwanted polarity reversal occurs.

4,496,850
SEMICONDUCTOR CIRCUIT FOR ENABLING A QUICK RISE OF THE POTENTIAL ON THE WORD LINE FOR DRIVING A CLOCK SIGNAL LINE

Yoshihiro Takemae, Tokyo; Shigeki Nozaki Kawasaki; Katsuhiko Kabashima, Mizusawa, and Seiji Enomoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 10, 1982, Ser. No. 347,465
Claims priority, application Japan, Feb. 12, 1981, 56-19312
Int. Cl.[3] H03K 17/04, 17/06, 17/693, 19/017
U.S. Cl. 307—269 13 Claims

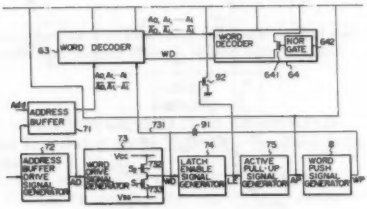
1. A semiconductor circuit for receiving a source voltage between first and second terminals, operatively connected to receive a potential push signal having first and second reference levels, for producing an output voltage higher than a source voltage at the first terminal of the source for driving a clock signal line, comprising:
a first circuit, operatively connected to the clock signal line

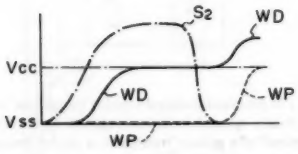
and the first terminal of the source, for pulling up the potential of the clock signal line to the source voltage;

a second circuit, operatively connected to the clock signal line and the second terminal of the source, for pulling down the potential of said clock signal line to a voltage lower than the source voltage;

a capacitor having a first electrode operatively connected to the clock signal line and having a second electrode operatively connected to receive the potential push signal, said capacitor pushing the potential of the clock signal line up to a potential higher than the source voltage, said capacitor comprising an MIS capacitor; and

a signal generating circuit, operatively connected to the second electrode of said capacitor, for producing the potential push signal, the potential of which changes from





the first reference level of the potential push signal to the second reference level of the potential push signal, and then from the second reference level of the potential push signal to the first reference level of the potential push signal, said signal generating circuit functioning during the time the potential of the clock signal line is pulled up to the source voltage by said first circuit, the potential of the push signal being at the first reference level so that said MIS capacitor remains uncharged, and after the potential of the clock signal line is pulled up, the potential of the potential push signal changes from the first reference level to the second reference level and then back to the first reference level, charging the MIS capacitor and exerting a bootstrap effect so that the potential of the clock signal line becomes higher than the source voltage.

4,496,851

DYNAMIC METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR CLOCKING CIRCUIT

Ebbin R. Southerland, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 1, 1982, Ser. No. 353,294
Int. Cl.[3] H03K *19/096, 19/20, 17/693*
U.S. Cl. 307—269 **5 Claims**

1. A dynamic metal oxide semiconductor field effect transistor clocking circuit for providing at least one output clock pulse at a fixed time interval after receiving an input pulse, the clocking circuit comprises:

a first stage means having a first stage node for providing a first stage output signal at the first stage node and wherein the first stage means includes;

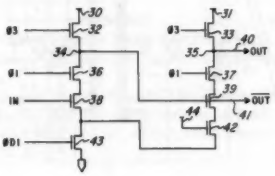
a first precharge means for precharging the first stage node at a first predetermined time interval;

an isolation means for isolating the precharged first stage node at a second predetermined time interval;

input means for receiving an output enable signal to the first stage means, the output enable signal having a first and second logic state;

discharge means for discharging the first stage node at a third predetermined time interval when the output enable signal is at the first logic state the first precharge means, the first stage node, the isolation means, the input means, and the discharge means being coupled in series, said discharge means being isolated from the first stage node by the isolation means and the input means when the output enable signal is at the second logic state;

second stage means having a second stage node for providing the output clock pulse at the second stage node and wherein the second stage means includes;



a second precharge means for precharging the second stage node at the first predetermined time intervals;

a second isolation means for isolating the precharged second stage node at the second predetermined time interval;

a second input means operably connected to first stage means for receiving the first stage output signal which is representative of the voltage level of the first stage node and having a first output logic state and a second output logic state;

coupling means for electrically coupling the discharge means to the second stage means for discharging the second stage node when the first stage output signal is at the first output logic state; and

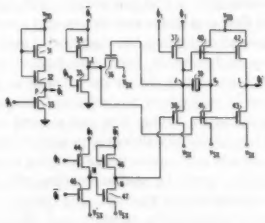
said coupling means being isolated from the second stage node by the second isolation means and the second input means when the first stage output signal is at the second output logic state.

4,496,852

LOW POWER CLOCK GENERATOR

Eugene M. Blaser, Hopewell Junction; Paul W. Chung, Wappingers Falls, both of N.Y., and Ramesh C. Varshney, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,707
Int. Cl.[3] H03K *17/06, 5/135, 17/10, 19/096*
U.S. Cl. 307—269 **10 Claims**



1. A clock generator circuit for producing an output clock signal having levels determined by positive and negative power supply levels in response to an input clock signal having

levels determined by said positive power supply level and a ground level, comprising:

an output transistor pair having conductive channels coupled in series between said positive power supply level and said negative power supply level;

a final drive transistor pair having channels coupled in series between said positive power supply level and said negative power supply level, gates of the transistors of said final drive transistor pair being coupled to gates of corresponding ones of the transistors of said output transistor pair;

a bootstrap capacitor coupled between a first node at the commonly coupled gates of one transistor of said output transistor pair and the corresponding transistor of said drive transistor pair, and a second node between said channels of said output transistor pair;

an inverter transistor having a channel coupled between said negative power supply level and a third node at the commonly coupled gates of the other transistor of said output transistor pair and the corresponding transistor of said drive transistor pair, and a gate coupled to said first node;

means for grounding said second node in response to said input clock signal going to said positive power supply level from said ground level until said inverter transistor is switched into its conducting state in response to charging of said bootstrap capacitor; and

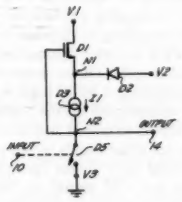
means for discharging said first node to said negative power supply level in response to said input clock signal going from said positive power supply level to said ground level.

4,496,853

STATIC LOAD FOR HIGH VOLTAGE DRIVER

Ronald W. Streiber, Smithtown, N.Y., assignor to General Instrument Corporation, New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,109
Int. Cl.³ H03K *3/01, 17/687*
U.S. Cl. 307—270 **11 Claims**



1. A circuit comprising:

a depletion mode FET having respective source, gate, and drain electrodes;

a first power supply terminal to which said drain electrode of said depletion mode FET is connected;

a unidirectional current conduction means having first and second electrodes for conducting current from said first to said second electrode thereof;

a second power supply terminal to which said first electrode of said unidirectional current conduction means is connected;

a current source means having first and second electrodes for conducting current between said first and second electrodes of said current source;

a first circuit node to which said second electrode of said undirectional current conduction means, the first electrode of said current source and the source electrode of said depletion mode FET are connected; and

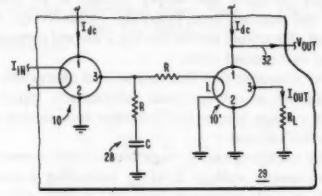
a second circuit node to which the gate electrode of said depletion mode FET and the second electrode of said current source are connected.

4,496,854

ON-CHIP SQUID CASCADE

Cheng-Chung J. Chi; Arthur Davidson, both of Yorktown Heights, and Chang-Chyi Tsuei, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,581
Int. Cl.³ H03K *3/38, 17/92*
U.S. Cl. 307—306 **17 Claims**



1. A superconducting circuit having high sensitivity and bandwidth, comprising in combination:

first and second DC SQUID stages located on the same superconducting chip, said first and second stages each including an input means, an output means, a superconducting loop having at least two Josephson devices therein and means for biasing each stage with a DC current, there being shunt resistors across said Josephson devices to render said devices nonhysteretic,

coupling means located on said superconducting chip for interconnecting said first and second stages with a high efficiency over a large bandwidth, and for transferring current from said first stage to said second stage, said coupling means including,

transmission line means connected to said shunt resistors of said first stage for receiving the current flowing in said shunt resistors,

impedance means for matching the impedance of said transmission line for maximum transfer of current to said second stage, said impedance means providing a real impedance over a large frequency range and having a sufficiently large magnitude to insure large bandwidth, and

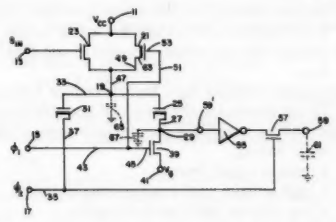
means for substantially preventing high frequency Josephson oscillations in said first stage from reaching the input means to said second SQUID stage.

4,496,855

HIGH VOLTAGE LEVEL DETECTOR AND METHOD

Michael M. Yamamura, Cupertino, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 25, 1982, Ser. No. 392,106
Int. Cl.³ H03K *5/153, 5/24*
U.S. Cl. 307—350 **11 Claims**



1. A high-voltage sensing logic circuit for detecting the occurrence of an input signal level applied to said logic circuit

which exceeds a predetermined threshold voltage level and for providing a unique output signal level in response thereto, said circuit adapted to operate over first and second time intervals from a voltage source providing supply and reference voltage levels at supply and reference voltage terminals, respectively, said circuit comprising:

first and second chargeable devices having first terminals connected to form a common node, said first chargeable device having a second terminal to which is alternately applied reference and supply voltage levels during said first and second time intervals, respectively, and said second chargeable device having a second terminal terminating in a second node;

means for charging said first and second chargeable devices to establish a voltage level substantially equal to said supply voltage level at said common node during said first time interval; and

means for clamping said voltage level of said common node to said supply voltage level by providing a conductive path from said common node to said supply voltage terminal when said input signal level exceeds said predetermined threshold voltage level during said second time interval to provide a low at said second node which is said unique output signal level;

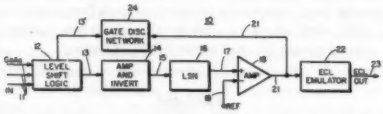
said alternately applied reference and supply voltage levels to said second terminal of said first chargeable device causing the voltage level of said common node to be boosted above said supply voltage level if the input signal does not exceed said predetermined threshold voltage level during said second time interval to provide a high at said second node.

4,496,856

GAAS TO ECL LEVEL CONVERTER

Stephen A. Ransom, Huntingdon Valley, and Tedd K. Stickel, Chalfont, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,514
Int. Cl.³ H03K *19/092, 19/094*
U.S. Cl. 307—475 **10 Claims**



1. A gallium arsenide (GaAs) level converter for driving an emitter coupled logic (ECL) circuit comprising:

a GaAs signal input source,

a GaAs level shifting network coupled to said signal input source,

a GaAs differential amplifier having an input coupled to said level shifting network and having an output,

a voltage reference source coupled to said differential amplifier,

an emitter coupled logic bipolar emitter follower emulator circuit coupled to the output of said differential amplifier,

said emitter coupled logic emulator comprising an output stage having,

a current supply branch,

a high voltage level control branch, and

a low voltage level control branch,

said branches being connected in parallel,

a termination resistor in series with said branches, and

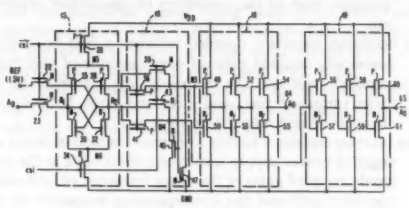
an emitter coupled logic output line intermediate said termination resistor and said branches of said emulator.

4,496,857

HIGH SPEED LOW POWER MOS BUFFER CIRCUIT FOR CONVERTING TTL LOGIC SIGNAL LEVELS TO MOS LOGIC SIGNAL LEVELS

Hu H. Chao, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1982, Ser. No. 437,991
Int. Cl.³ H03K *19/096, 17/284, 17/693*
U.S. Cl. 307—475 **3 Claims**



1. A buffer circuit for providing a MOS logic level from a TTL logic level comprising:

a cross coupled latch formed from a first pair and a second pair of transistors, said pairs connected together in parallel, each of said transistor pairs including an N channel FET and P channel FET serially connected, the gate connections of each transistor pair forming first and second nodes with the common channel connection of the remaining transistor pair, said first and second switches serially connected to each end of said parallel pairs for supplying current to first and second ends of said transistor pairs in response to a clock signal, CSI, and an inverse clock signal, $\overline{CSI}$,;

means for connecting a power supply across ends of said first and second switches;

first and second transistor gates connected to provide first and second signal paths to said nodes, one of said transistor gates connected to receive a TTL logic input level, and the second to receive a reference voltage level, said transistor gates operating in response to said $\overline{CSI}$ signal;

first and second FET inverter chains, each having an input and output, said inverter chains connected to a supply of voltage for establishing a MOS logic level; and

first and second current path means connecting one of said inverter chain inputs to one of said nodes and the remaining of said inverter chain inputs to the remamining of said nodes, said current path means operative in response to said CSI signal and $\overline{CSI}$ signal to open and close said current path means; whereby said signals at a first logic state connect said nodes to said reference level and TTL logic level, and open said current path means, and at a second logic state operates said cross coupled latch and connect said nodes to said inverter chain inputs whereby complementary MOS logic levels are produced.

4,496,858

FREQUENCY TO VOLTAGE CONVERTER

Michael D. Smith, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

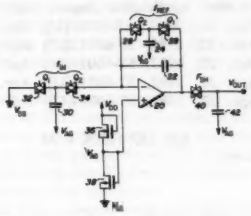
Continuation of Ser. No. 334,279, Dec. 24, 1981, abandoned. This application Apr. 13, 1984, Ser. No. 599,595
Int. Cl.³ H03K *5/22, 5/00*
U.S. Cl. 307—519 **3 Claims**

1. A frequency to voltage converter comprising:

an operational amplifier, having a first and a second input and an output;

a switched capacitor feedback means connected between the first input and the output of the operational amplifier and being switched at a first frequency to allow the operational amplifier to integrate a signal applied to the input of the operational amplifier;

capacitor means switchably connected to the first input of the operational amplifier and to a voltage source and to being switched at a second frequency for storing a charge from the voltage source and for tranferring the charge to the input of the operational amplifier, and a reference



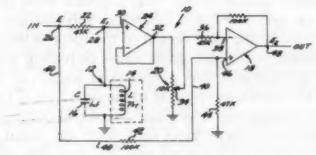
voltage applied to the second input of the operational amplifier and to one plate of the capacitor means and one plate of the capacitor of the feedback means, whereby the output voltage of the operational amplifier is a function of the first switching frequency and the second switching frequency.

4,496,859

NOTCH FILTER SYSTEM

Robert C. Crooks, Huntington Beach, Calif., assignor to Barcus-Berry, Inc., Huntington Beach, Calif.

Filed Sep. 30, 1982, Ser. No. 430,850
Int. Cl.³ H03H *11/12, 11/16*
U.S. Cl. 307—520 **28 Claims**



15. A notch filter system for substantially eliminating a specific frequency from a first AC electrical signal, which comprises:

an input terminal to which said first signal is applied, and an output terminal;

phase-responsive circuit means comprising a tuned circuit that is tuned to said specific frequency and is phase-responsive to frequency variations above and below said specific frequency, said phase-responsive circuit means having an output junction and being electrically connected to said input terminal for application of said first signal to said phase-responsive circuit means to develop a second AC electrical signal at said junction that is in phase with said first signal only at substantially said specific frequency;

a differential amplifier having first and second inputs and having an output that is connected to said output terminal, said differential amplifier being responsive to input signal phase differences;

first connection circuit means from said input terminal to said first amplifier input to deliver said first signal to said first amplifier input, and second connection circuit means from said junction to said second amplifier input to deliver said second signal to said second amplifier input; and

balancing circuit means electrically connected to at least one of said connection circuit means for balancing the amplitudes of said first and second signals at said amplifier inputs at said specific frequency;

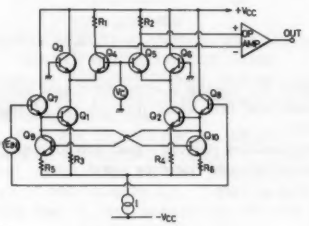
said differential amplifier substantially cancelling said signals at said output terminal at substantially said specific frequency where they are in phase but not at frequencies above and below said specific frequency where they are not in phase.

4,496,860

VOLTAGE-CONTROLLED ATTENUATOR

Akio Tokumo, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,934
Claims priority, application Japan, Mar. 27, 1981, 56-44167
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—542 **4 Claims**



1. A voltage-controlled attenuator comprising:

a pair of differential amplifiers for generating a pair of output signals for attenuation gain control, each of said differential amplifiers comprising a pair of first and second transistors having commonly connected emitters; and a driver differential amplifier comprising a third pair of transistors wherein each transistor in said third pair has its respective collector connected to one of the commonly connected emitters of one of said first and second pairs of transistors in said pair of differential amplifiers for driving said pair of differential amplifiers, first and second emitter followers respectively connected to first and second input terminals of said driver differential amplifier; and first and second control transistors connecting said respective emitter followers to transistors of said driver differential amplifier in a current mirror mode such that the operating current of said first emitter follower and the operating current of a first transistor of said third pair of transistors in said driver differential amplifier and the operating current of said second emitter follower and the operating current a second transistor of said third pair of transistors in said driver differential amplifier are proportional, and

an operational amplifier, said output signals from said pair of differential amplifiers being applied to said operational amplifier for subtraction, an output of said operational amplifier being substantially distortion free.

4,496,861

INTEGRATED CIRCUIT SYNCHRONOUS DELAY LINE

Mel Bazes, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.

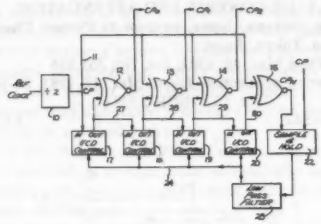
Filed Dec. 6, 1982, Ser. No. 447,231
Int. Cl.³ H03K *5/13, 5/159*
U.S. Cl. 307—602 **14 Claims**

1. An integrated circuit delay line apparatus for generating at least a first delayed signal synchronized with a reference signal, comprising:

a plurality of delay means, each for providing a controllable delay, each of said delay means coupled to receive a control signal for controlling the durations of said delays;

the first of said delay means being coupled to receive said reference signal, each of the remaining said delay means being sequentially coupled to receive the delayed reference signal from said first delay means;

control signal generation means for generating said control signal, said generation means coupled to receive said delayed reference signal from the last one of said sequentially coupled delay means; and,



tap means for tapping a signal from said delay means to provide said first signal through use of said reference signal;

whereby said first delayed signal is synchronized with and delayed from said reference signal.

4,496,862

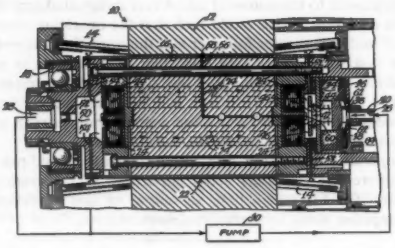
HIGH SPEED GENERATOR AIR VENT FOR AIR GAP

Kent Weber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 5, 1983, Ser. No. 520,725

Int. Cl.³ H02K *1/32, 9/26*

U.S. Cl. 310—56 **6 Claims**



1. In a rotary electric machine, the combination of:

a stator;

a rotor having an outermost periphery spaced from said stator by an air gap and journalled for rotation relative to the stator about an axis of rotation;

electrical windings carried by at least one of said stator and said rotor;

a fluid inlet on said rotor;

a fluid outlet on said rotor spaced from said fluid inlet;

means, including a cooling liquid flow path, in said rotor interconnecting said inlet and outlet, said liquid flow path being in heat exchange relation to said windings with at least a part thereof displaced from said axis of rotation; and

a gas vent passage in said rotor for said liquid flow path and opening at said outermost periphery to said air gap.

4,496,863

SALIENT-POLE ROTOR OF A ROTARY ELECTRIC MACHINE

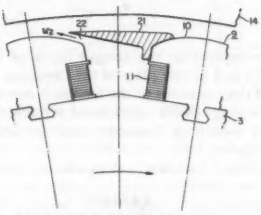
Kenji Sawatani, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,235

Claims priority, application Japan, Apr. 22, 1982, 57-60009[U]; Apr. 22, 1982, 57-60010[U]; Apr. 22, 1982, 57-60011[U]; Apr. 22, 1982, 57-60012[U]; Apr. 22, 1982, 57-60013[U]; Apr. 22, 1982, 57-60014[U]; Apr. 22, 1982, 57-60015[U]; Apr. 22, 1982, 57-60016[U]; Apr. 22, 1982, 57-60017[U]; Apr. 22, 1982, 57-60019[U]; Apr. 22, 1982, 57-60022[U]

Int. Cl.³ H02K *9/16*

U.S. Cl. 310—61 **8 Claims**



1. In a salient-pole rotor of a rotary electric machine, axial inner passages in the rotor for cooling medium, radial passages between poles for said cooling medium to flow radially towards an air gap between the rotor and a stator, radial ventilation ducts in the stator, and separate nonmagnetic guide vanes attached to and located only adjacent head portions of the poles on said rotor and extending substantially continuously over the whole axial length of the rotor between neighboring adjacent poles, said guide vanes providing guide paths extending substantially the whole axial length of the rotor slanting in the direction opposite to the direction of rotation of said rotor to change the flow direction of said cooling medium from radial flow to peripheral flow from the radial passages between said poles into said air gap in a direction opposite to the direction in which the rotor rotates, to reduce the angular momentum of said cooling medium before entry under radial momentum into said radial ventilation ducts in the stator, and members fastened to the rotor and located between poles for securing said separate nonmagnetic guide vanes to the rotor, said members leaving the radial passages substantially unobstructed for radial flow of cooling medium from radial ventilation ducts and said axial inner passages in the rotor and through said guide paths into said air gap.

4,496,864

BRAKE MOTOR

Constantin Apetrei; Victor Nitigus; Demeter Elek; Marian Radulescu, and Toma Sachelaire, all of Bucuresti, Romania, assignors to Research Institute for the Electrotechnical Industry—ICPE, Bucharest, Romania

PCT No. PCT/RO81/00004, § 371 Date Jul. 30, 1982, § 102(e) Date Jul. 30, 1982, PCT Pub. No. WO82/01965, PCT Pub. Date Jun. 10, 1982

Continuation of Ser. No. 406,232, Jul. 30, 1982, abandoned.

PCT Filed Aug. 4, 1981, Ser. No. 600,590

Claims priority, application Romania, Dec. 2, 1980, 102742

Int. Cl.³ H02K *7/102*

U.S. Cl. 310—77 **3 Claims**

1. An induction motor with automatic braking upon deenergization comprising:

a motor housing;

a shaft journaled in said housing for rotation about an axis;

a stator formed in said housing surrounding said shaft and comprising a stack of normal stator sheets and a further

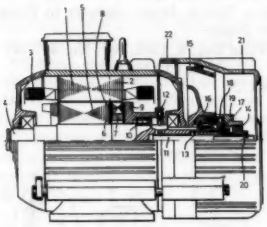
stack of sheets axially extending said stator on one side thereof;

a rotor carried by said shaft and comprising a stack of normal rotor sheets surrounding said shaft and surrounded by said stack of normal stator sheets, a magnetic separator at said side of said stack of normal rotor sheets, and a toothed extension of said rotor adjacent said magnetic separator and formed from a respective sheet stack with slots between the teeth within said extension of said stator;

a short-circuiting ring wholly within the extension of said stator, surrounding said shaft and short-circuiting said teeth;

a magnetic armature surrounding said shaft and axially shiftable thereon at said side and juxtaposed with said stack of sheets forming said teeth and with said short-circuiting ring, said armature extending axially away from said rotor, said shaft being provided with a bore and with a radial passage opening into said bore;

a rod in said bore coupled with said armature at an end thereof remote from said rotor through said passage;



a fan carried on said shaft and rotatably entrained thereby while being axially shiftable on said shaft;

means adjustably connecting said fan to said rod for axial displacement thereby, said fan and said housing defining a brake which is disengaged by axial displacement of said fan, said rod and said armature by the application of a magnetic field to said armature;

stator windings on said stator for mechanically energizing same to generate said magnetic field and a field rotating said rotor and said shaft; and

a spring in said shaft acting upon said rod in a direction opposite the direction upon which said magnetic field acts thereon, said means adjustably connecting said rod to said fan including:

a threaded member mounted on said shaft and connected thereto by a removable pin and forming a seat for said spring, and

a threaded nut mounted on said thread member for screwing engagement therewith and connected to said fan.

4,496,865

METHODS AND APPARATUS FOR TRANSLATING ELECTRIC MOTOR ROTATION INTO LINEAR TRAVEL

Robert E. Allen, Woodland Hills, and James T. Thomasson, Sunland, both of Calif., assignors to Newport Corporation, Fountain Valley, Calif.

Filed Aug. 12, 1982, Ser. No. 407,532
Int. Cl.³ G01B 7/02
U.S. Cl. 310—80 **6 Claims**

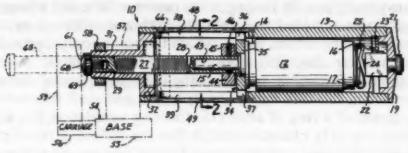
1. A method of operating a rotary electric motor in a tubular housing, comprising the steps of:

providing two diametrically opposed keyways in said tubular housing;

providing a keyplate for translating rotation of said motor into linear travel;

attaching said keyplate to said motor for axial movement of said motor in said housing; and

restraining said keyplate against rotation at two points diametrically opposite each other relative to said keyplate, by providing said keyplate with two keys located opposite each other and projecting into said diametrically opposed



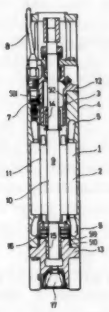
keyways, with said two keys and keyplate being provided as one solid unit.

4,496,866

SUBMERSIBLE ELECTRIC MOTOR AND METHOD OF MANUFACTURING THE SAME

Sakuei Yamamoto; Mitsuhiro Nishida; Noboru Tashiro, and Nobuo Sonoda, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 13, 1982, Ser. No. 339,208
Claims priority, application Japan, Jan. 17, 1981, 56-6612; Jan. 17, 1981, 56-6614; Jan. 17, 1981, 56-6618; Jan. 17, 1981, 56-6619; Jan. 17, 1981, 56-6620; Jan. 17, 1981, 56-6621; Jan. 17, 1981, 56-6622; Jan. 17, 1981, 56-6623; Jan. 17, 1981, 56-6624
Int. Cl.³ H02K 5/12
U.S. Cl. 310—87 **6 Claims**



1. A submersible electric motor comprising an annular stator core having stator coils thereon, a hollow cylindrical can fitted within said stator core to cover the inner surface thereof, a one piece molded resin member surrounding the outer wall of said stator core, both ends of said stator core and the end portions of said stator coils, a pair of end brackets secured to opposite ends of said molded resin member and having bosses extending into said can and rotor means rotatably supported within said can by means of said brackets, said can and said brackets forming a closed chamber adapted to receive a lubricant and sealing means interposed between said bosses and said can to prevent leakage of said lubricant from said chamber.

4,496,867

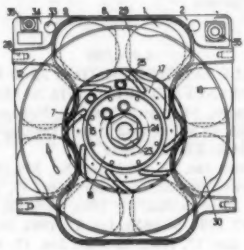
ELECTRIC RETARDERS FOR VEHICLES

André J. P. Marandet, Saint Gratien, and Marc Charbonnier, Franconville, both of France, assignors to Labavia -S.G.E., France

Filed Feb. 6, 1984, Ser. No. 577,023
Claims priority, application France, Feb. 10, 1983, 83 02141
Int. Cl.³ H02K 49/00
U.S. Cl. 310—93 **10 Claims**

1. An electric retarder for braking the transmission shaft (A) of a vehicle, in which the stator comprises at least one ring of coils (1) even in number whose individual axes (Y) are all

parallel to that (X) of the retarder, with axes (Y) of the endmost lateral coils superimposed in pairs in two vertical planes, the cores of the different coils being all supported by a same transverse plate (2) having in its center a bore for letting the shaft to be retarded pass therethrough and stiffened by a rib projecting therefrom, and in which the rotor comprises at least one annular disk (16) made from a ferromagnetic material adapted for traveling past said ring of coils, at a small distance therefrom, this disk being connected to said shaft successively by means of a ring of arms (15) forming ventilation fins and a fixing ring (17), characterized in that the stiffening rib of plate (2) extends along a closed curve having two halves symmetrical with each other with respect to the axial vertical plane of the retarder and in that each half of this curve comprises, connected successively together, a horizontal section or substantially such (8) extending above an upper coil (1), along the upper edge of the plate (2), a curved section (9) running laterally and externally alongside this coil, an oblique radial section (10) extending towards the axis (X) of the retarder between said coil and the lower adjacent coil, a substantially vertical section (7) inside the ring of coils, an oblique radial section (10) extending outwardly between two coils, a curved section (9) running laterally and outwardly alongside a lower coil and a horizontal section or substantially such (8) extending below this latter lower coil along the lower edge of the plate.

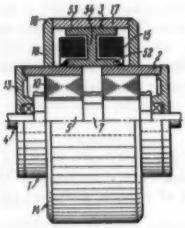


4,496,868

ELECTRICAL MACHINE

Nikolai P. Advolotkin; Svetlana A. Belyaeva; Igor E. Ovchinnikov; Nikolai I. Lebedev; Alexei J. Yankovsky; Stanislav P. Sytykh; Jury A. Khrenov, and Vladimir N. Axenov, all of Leningrad, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Elektromashinostroenia, Leningrad, U.S.S.R.

Filed Apr. 18, 1983, Ser. No. 486,181
Int. Cl.³ H02K *7/20*
U.S. Cl. 310—112 **8 Claims**



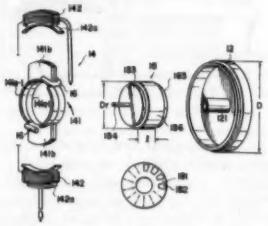
1. An electrical machine with a housing comprising:
cylindrical magnetically conductive portions; a cylindrical non-magnetic portion shaped like a double-T beam in an axial section and said double-T beam having an outer flange and an inner flange connected with said magnetically conductive portion of said housing; a rotor mounted within said housing and having at least two pole systems having pole projections, said pole systems interconnected by a magnetic circuit means; a stator mounted within said housing and having at least two stacks of laminations, each of said stator stacks being secured to one of said magnetically conductive portions, and said stator stacks being equal in number to said magnetically conductive portions; and an excitation system connected to said outer flange of said double T-beam mounted on the outside of said housing and including a coil which is disposed between said inner and outer flanges of the double-T beam on both sides of a crosspiece and an outer magnetic circuit in the form of a ring of U-shaped sections composed of at least two portions interconnected in a radial direction by means of a detachable joint which encloses said coil and adjoins said magnetically conductive portions of said housing.

4,496,869

SMALL SHADED-POLE MOTOR

Toshiro Hosoya, Tokyo, Japan, assignor to Tobishi Industries Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,787
Int. Cl.³ H02K *17/10*
U.S. Cl. 310—172 **10 Claims**



1. A small-shaded-pole motor comprising a rotor, a stator core disposed in concentric relationship with the rotor, stator coils wound on the stator core and shading coils disposed in the vicinity of the stator core, characterized in that said stator core comprises two generally rectangular plates each having a ring-shaped stamped and swaged projection and a flat plate portion, said ring-shaped projection extending in a direction perpendicular to the plane of the plate, the height of said ring-shaped projection at its inner side being equal to about a half of the thickness of said rotor in its axial direction, said two plates being assembled together back to back so that their ring-shaped projections define a cylindrical space for said rotor and so that said flat plate portions are in planar contact with each other, and said stator coils are mounted on said flat plate portions of said back to back assembled plates.

4,496,870

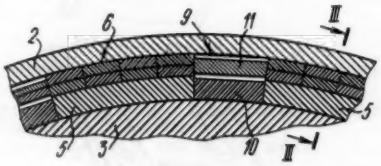
ARRANGEMENT FOR SUPPORTING STATOR END WINDINGS OF AN ELECTRICAL MACHINE

Jury F. Antonov; Vadim I. Iogansen; Alexei S. Tkachenko; Vladimir P. Chernyavsky, and Aron B. Shapiro, all of Leningrad, U.S.S.R., assignors to Leningradskoe Proizvodstvennoe Elektromachinostroitelnoe Obiedinenie "Elektrosila", Leningrad, U.S.S.R.

PCT No. PCT/SU81/00044, § 371 Date Jan. 6, 1983, § 102(e) Date Jan. 6, 1983, PCT Pub. No. WO82/04362, PCT Pub. Date Dec. 9, 1982
PCT Filed May 26, 1981, Ser. No. 459,577
Int. Cl.³ H02K *3/46*
U.S. Cl. 310—260 **3 Claims**

1. An arrangement for supporting stator end windings of an electrical machine, comprising a clamping plate operatively

associated with the stator core of said machine and having a projecting portion, an insulating ring tightly embracing the end windings, resilient strips disposed on the outer surface of the insulating ring and spaced apart around the periphery thereof, means for pressing the resilient strips against the insulating ring in a radial direction, said pressing means being interposed between the projecting portion of the clamping plate and the resilient strips, and being in contact with said projecting portion, rigid plates extending around the periphery of the insulating ring between the resilient strips (5), and resilient members



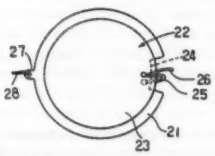
mounted on respective ones of said rigid plates and provided with locking elements (12) to prevent axial displacement of said resilient members, said resilient members (9) being in contact with the projecting portion (2) of the clamping plate (1), each of said resilient members (9) comprises a rigid plate (10) arranged on the insulating ring (3), and a resilient ripple-shaped strip (11) bearing with convex portions of one rippled surface thereof against the rigid plates (10) and with convex portions of the other rippled surface thereof, against the projecting portion (2).

4,496,871

PARALLEL TYPE PIEZOELECTRIC BIMORPH VIBRATOR

Manabu Sumita, Kanazu, and Toshiaki Yamashita, Kanazawa, both of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,128
Claims priority, application Japan, Aug. 27, 1982, 57-130238[U]
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—324 **6 Claims**



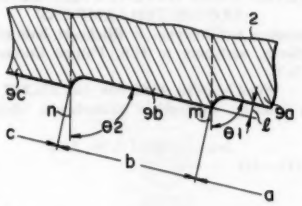
1. A parallel type piezoelectric bimorph vibrator comprising:
a diaphragm,
piezoelectric elements fixed to both surfaces of said diaphragm,
outside electrodes mounted at said piezoelectric elements, and
a conductor connected to outer peripheries of said outside electrodes,
said diaphragm being provided at a part of its outer periphery with a cutout portion,
said outside electrodes at said piezoelectric elements being connected by the conductor at said cutout portion,
wherein said cutout portion provided at the outer periphery of said diaphragm is formed to a depth beyond the outer periphery of each of said piezoelectric elements radially inwardly thereof so that the cutout portion prevents the conductor from contacting the diaphragm.

4,496,872

SEALED BEAM TYPE REFLECTIVE LAMP

Nobuyoshi Kuno, Yokohama, and Kiyokazu Honda, Zushi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 5, 1982, Ser. No. 365,384
Claims priority, application Japan, Apr. 7, 1981, 56/51058
Int. Cl.³ H01K *1/30*
U.S. Cl. 313—113 **2 Claims**



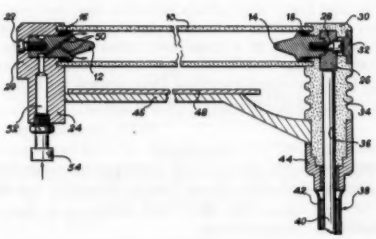
1. A spot-lighting sealed beam type reflective lamp having an envelope comprising a front lens and a reflector on an inner surface of which is formed a metal reflective film, and a tungsten coil filament arranged inside said envelope, wherein said front lens consists of a central circular lens element and a plurality of concentric ring-shaped prism lens elements, inner surfaces of said prism lens elements defining a stepped inner surface of said front lens, and wherein an angle formed by a central axis of said lamp and an inner surface of said prism lens element, which is substantially in the radial direction of said lens, is greater than that of the next prism lens elements situated outwardly thereof, a step difference of said inner surfaces between adjacent ones of said prism lens elements being not greater than 0.6 mm and radial widths of said prism lens elements increasing toward the central circular lens element.

4,496,873

FLASH TUBE HAVING COAX CABLE CONNECTOR

Marcel Bédu, Clamart; Jean Claude Farcy, Bris-sous-Forges, and Christian Goin, Grigny, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 4, 1982, Ser. No. 385,254
Claims priority, application France, Jun. 5, 1981, 81 11143
Int. Cl.³ H01J *61/28, 61/80;* H01S *3/092*
U.S. Cl. 313—231.71 **2 Claims**



1. A flash tube comprising a discharge tube made from a transparent material, a first electrode located at a first end of the discharge tube, a second electrode located at a second end of the discharge tube, said first electrode being raised to earth potential and said second electrode to a high potential, said first electrode being fixed into a metal end fitting, provided with a metal sleeve positioned radially with respect to the discharge tube, said second electrode being fixed to a metal connecting piece located in an insulating end fitting provided with an insulating sleeve positioned radially with respect to the

discharge tube, said sleeve being traversed by a pipe, a coaxial cable having a central conductor following the pipe of the insulating sleeve and being connected to said metal connecting piece of said second electrode, said coaxial cable having an outer conductor which is connected to said metal sleeve of said first electrode by a metal bar parallel to said discharge tube, an optical reflector being fixed to said metal bar.

4,496,874

ELECTRIC LAMP HAVING A MECHANICALLY CONNECTED LAMP CAP

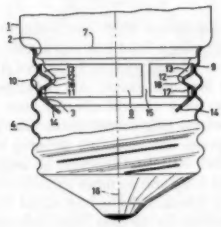
Rudolf Sanders, and Josephus F. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1982, Ser. No. 376,807

Claims priority, application Netherlands, May 27, 1981, 8102594

Int. Cl.³ H01J *5/48, 5/50*

U.S. Cl. 313—318 **10 Claims**



1. An electric lamp comprising a glass lamp envelope having a neck-shaped lamp envelope portion and a lower edge on said lamp envelope portion, a substantially cylindrical metal lamp cap provided on the neck-shaped lamp envelope portion and around the lower edge thereof, and an electric light source accommodated in the lamp envelope and connected to the lamp cap by current supply conductors, the lamp cap which has an upper edge abutting against the lamp envelope, being attached to the lamp envelope by means of a split metal ring with its outer surface bears against the inner wall surface of the lamp cap and is secured thereto, and on its inner surface has rigid projecting parts which are each provided with a lower wall portion directed towards the said lower edge and engage in a respective recess in the neck-shaped lamp envelope portion, each of which recesses has a lower wall portion present near the said lower edge, characterized in that the lower wall portion of each of the projecting parts is in contact with the lower wall portion of a respective recess and that the split metalring has lugs which, at least at the beginning of the lifetime of the lamp, exert a resilient force against the lower edge of the neck-shaped lamp envelope portion.

4,496,875

CONDUCTOR COMPOSITION AND DEVICES USING IT

Edward G. Barth, Union; Ruvim Braude, Elizabeth, and Nicholas W. Kay, Mine Hill, all of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 22, 1983, Ser. No. 506,842

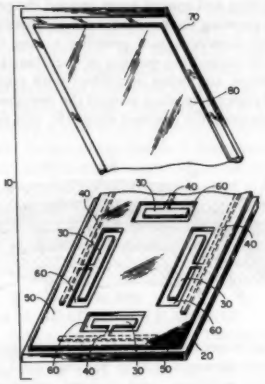
Int. Cl.³ H01J *17/00*

U.S. Cl. 313—632 **4 Claims**

1. A conductor ink for forming thick film conductors on a soda lime substrate fireable at temperatures below 590° C. and comprising nickel powder, a lead-free glass frit binder and a vehicle,

said nickel powder having a spherical structure and

the glass frit in said binder having a composition comprising about 20% by weight of SiO_2, about 20% by weight of B_2O_3, about 3% by weight of CaO, about 40% by weight of ZnO, about 5% by weight of Al_2O_3, about 7% by weight of Na_2O, about 4% by weight of K_2O, and about 1% by weight of Li_2O,



the nickel powder being present in about 76 weight percent and the glass frit binder being present in about 12 weight percent, with the remainder being the vehicle.

4,496,876

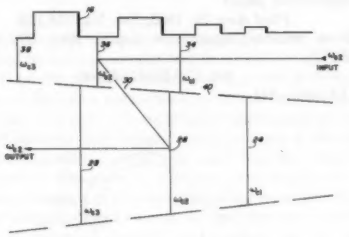
FREQUENCY-SPREADING COUPLER

Leo Young, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1982, Ser. No. 422,122

Int. Cl.³ H01J *25/00*

U.S. Cl. 315—4 **22 Claims**



1. A travelling wave amplifier comprising:

a tapered interaction waveguide wherein the cross-section thereof gradually increases from a small first end to a large second end for propagating electromagnetic energy in a broad frequency band therein, said interaction waveguide having a plurality of first cutoff planes corresponding to frequencies in the frequency band of the amplifier;

means for injecting an electron beam into the small end of said interaction waveguide;

an input waveguide for receiving electromagnetic waves to be amplified therein, wherein said input waveguide is a tapered low pass filter having a small third end and large fourth end, said input waveguide being coaxially disposed around said interaction waveguide with said small third end adjacent to said small first end and said large fourth end adjacent to said large second end, said input waveguide with a plurality of second cutoff planes corresponding to frequencies in the frequency band of the amplifier, wherein said input waveguide is positioned so that each of said second cutoff planes in said input waveguide corresponding to ω_c is displaced in the direction of increasing

cross-section of said interaction waveguide from each of said first cutoff planes in said interaction waveguide corresponding to ω_c, where ω_c is any frequency in the frequency band of the amplifier; and

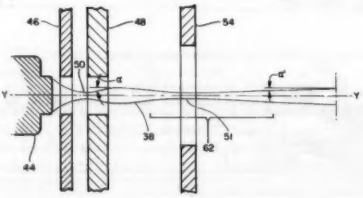
coupling means, disposed between the cutoff planes corresponding to ω_c in said interaction waveguide and said input waveguide, for coupling the electromagnetic waves in said input waveguide into said interaction waveguide.

4,496,877

UNIPOTENTIAL ELECTRON GUN FOR SHORT CATHODE RAY TUBES

Cindee C. Kueny, Mt. Prospect, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 6, 1982, Ser. No. 366,024
Int. Cl.³ H01J *29/46, 29/56*
U.S. Cl. 315—15 **4 Claims**



1. A high-performance unipotential-type electron gun comprising:

a series of apertured electrodes having electrical potentials thereon for establishing electrostatic fields therebetween,

said electrodes being aligned in spaced relation on an axis, and being in the order named,

lower end means consisting of a cathode (K) for generating a source of electrons from which an electron beam is formed,

an apertured plate control electrode (G1) having an aperture diameter approximately 0.025 in. for controlling, in conjunction with said cathode, the density of said beam,

and an apertured plate grid electrode (G2) having an aperture diameter approximately 0.025 in. and spaced approximately 0.010 in. from electrode (G1) for forming, in conjunction with said cathode and said control electrode, a first cross-over constriction in said beam,

said beam exhibiting upon divergence from said cross-over construction a relatively steep cross-over emergence angle in the range of 60 to 80 milliradians,

said gun including uni-potential focus lens means consisting of a cylindrical initial accelerating electrode (G3) spaced approximately 0.040 in. from electrode (G2),

a cylindrical focusing electrode (G4), and

a cylindrical final accelerating electrode (G5) for producing a finely focused electron beam,

the dimensions and spacings, in conjunction with the potentials applied to the electrodes of said lower end means being effective to induce a second constriction of said beam upon entry of said beam into said focus lens means for providing, upon subsequent divergence of said beam, a relatively shallow focus lens entry angle in the range of 33 to 39 milliradians,

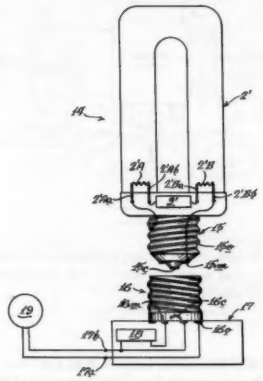
said relatively shallow focus lens entry angle being effective to provide for optimum filling of said lens by said beam for producing said finely focused beam of electrons.

4,496,878

SCREW-IN FLUORESCENT LAMP

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Apr. 13, 1982, Ser. No. 367,911
Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—73 **4 Claims**



1. A fluorescent lamp assembly adapted to be powered from a current-limited voltage source and to be used in screw-in-type sockets of the kind normally used with three-way incandescent lamps said assembly comprising:

a fluorescent lamp having a first and a second cathode, each cathode having a first and a second input terminal,

a fluorescent lamp starter connected between the second input terminal of said first cathode and the first input terminal of said second cathode, and

a three-way screw-base adapted to be screwed into and used in said screw-in-type sockets, said screw-base having a first, a second and a third base terminal, said first base terminal being directly connected with the first input terminal of said first cathode, said second base terminal being directly connected with the second input terminal of said second cathode, said third base terminal being left non-connected.

4,496,879

SYSTEM FOR DRIVING AC PLASMA DISPLAY PANEL

Joseph T. Suste, Orange, Calif., assignor to Interstate Electronics Corp., Anaheim, Calif.

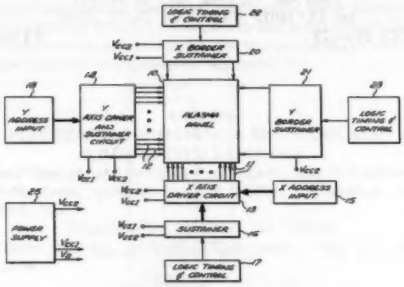
Continuation of Ser. No. 412,205, Aug. 27, 1982, abandoned, which is a continuation of Ser. No. 166,579, Jul. 7, 1980, abandoned. This application Nov. 23, 1983, Ser. No. 554,176
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—169.4 **18 Claims**

1. A method of erasing a location on an AC plasma panel, said panel having an X axis and a Y axis, said X axis having a plurality of X addresses and X electrodes associated therewith, said Y axis having a plurality of Y addresses and Y electrodes associated therewith, said location being defined by one of said X electrodes and one of said Y electrodes, the method comprising:

generating an X axis erase pulse, and applying said X axis erase pulse to said one X electrode;

generating a Y axis sustain pulse, and applying said Y axis sustain pulse to said plurality of Y electrodes, except,

during the duration of said X axis erase pulse, not applying said Y axis sustain pulse to said one Y electrode; and



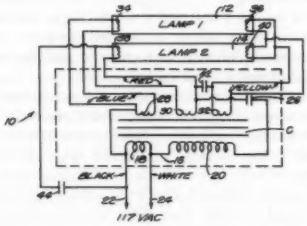
generating a Y axis erase pulse subsequent to said Y axis sustain pulse, and applying said Y axis erase pulse to said plurality of Y electrodes.

4,496,880

FLUORESCENT LAMP BALLAST

Harald Lück, Cheruskerweg 56, 6000 Frankfurt/M 80, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,717
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—228 **3 Claims**



1. A fluorescent ballast arrangement comprising:

(a) a conventional ballast including:

a primary winding for connection to the AC line, said primary winding having first and second ends;

a first secondary winding, said first secondary winding having first and second ends, said first end of said secondary winding being connected to the second end of said primary winding to form an autotransformer;

a power factor correction capacitor having a first terminal connected to said second end of said first secondary winding and a second terminal;

second, third and fourth secondary windings for connection to filament heaters contained at each end of each of a pair of fluorescent lamps driven by said ballast, said lamps being series-connected through commonly connected heater windings driven by said third secondary winding, the second terminal of said power factor correction capacitor being connected to one lead of said second heater winding, said one lead of said second heater winding also connected to one lead of said third heater winding by a starter capacitor, said first end of said primary winding also being connected to one lead of said fourth heater winding; and

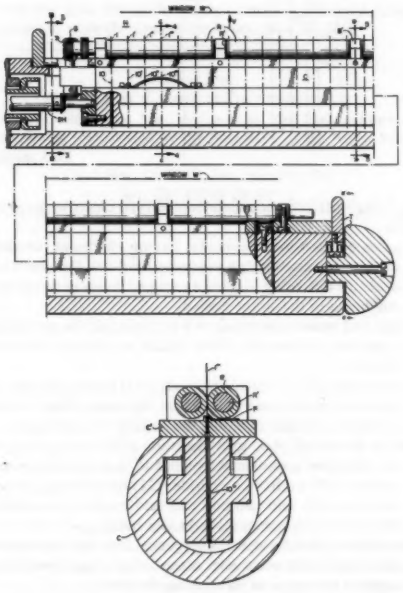
(b) a power reducing capacitor connected effectively across said lamps, said power reducing capacitor being connected between said first end of said primary winding and the other lead of said second heater winding, said power reducing capacitor for reducing the amount of power supplied to the ballast arrangement for a given AC line voltage without reducing the light emitted by the lamps by an amount proportionately as large.

4,496,881

METHOD OF COLD CATHODE REPLENISHMENT IN ELECTRON BEAM APPARATUS AND REPLENISHABLE COLD CATHODE ASSEMBLY

Richard N. Cheever, Acton, Mass., assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed Sep. 29, 1982, Ser. No. 427,862
Int. Cl.³ H01J *37/067, 1/30*
U.S. Cl. 315—357 **7 Claims**



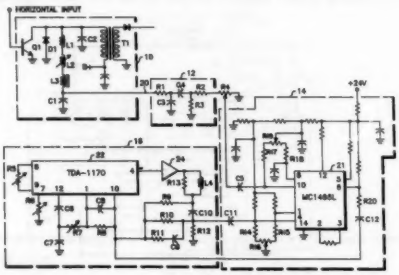
1. Apparatus for generating an electron beam of elongated cross-section, said apparatus comprising an elongated evacuated housing having an elongated cathode structure extending longitudinally therein and elongated anode means extending longitudinally of said housing and spaced from said cathode structure, said apparatus being characterized in that said cathode structure has a plurality of substantially parallel cathode rods spaced along the length of said cathode structure with the length of the rods transverse to said cathode structure, said rods having means for advancing the same toward said anode means in response to a control signal to provide replacement of eroded cathode material, and in that said apparatus includes means for monitoring variations in electron beam performance and for producing said control signal, whereby the electron beam performance may be maintained substantially constant.

4,496,882

INDUCTORLESS PINCUSHION CORRECTION CIRCUIT

Kirk D. Oliver, Glendale Heights, and David A. Wolff, St. Charles, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 3, 1982, Ser. No. 446,529
Int. Cl.[3] H01J 29/56
U.S. Cl. 315—371 5 Claims



1. A CRT raster scanning circuit with pincushion correction and comprising:

first scanning means for providing a first raster scanning signal at a first frequency, said first scanning signal having the form of a parabolic segment;

wave shaping means coupled to receive said first raster scanning signal and including filtering means and phase adjusting means;

level control means coupled to the output of the wave shaping means;

first yoke means for applying said shaped and controlled parabolic scanning signal to the beam of the CRT;

second scanning means for providing a second, sawtooth shaped raster scanning signal at a second frequency and including power amplifier means;

second yoke means for applying said second raster scanning signal to the beam of the CRT;

multiplier means coupled to receive and to multiply the first and second scanning signals and including a first multiplier circuit biased to provide 180 degree phase shift in the product signal, and a second multiplier circuit including control means for adjusting the balance of the product signal; and

feedback means for coupling the product signal back to an input of the power amplifier means.

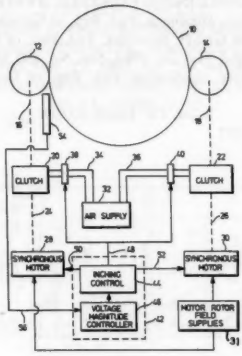
4,496,883

ELECTRIC INCHING IMPULSE CONTROL

Peter D. Eastcott, and Ronald C. Trussler, both of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 448,316, Dec. 9, 1982, abandoned. This application Dec. 1, 1983, Ser. No. 556,906
Claims priority, application Canada, Dec. 10, 1981, 391915
Int. Cl.[3] H02P 1/54, 7/74
U.S. Cl. 318—98 4 Claims

1. An electric inching control means for inching a drive system comprising a load driven through gearing by two or more three phase synchronous motors coupled to said load through respective fluid actuated clutches once said clutches are locked-up and said synchronous motors are synchronized, each motor having a stator and a rotor, each stator having a three phase stator winding and each rotor having a field winding; said inching control means comprising: means for energizing said synchronous motors, including means for applying direct current excitation to said field winding on rotors of the synchronous motors and means for applying a stepped direct current voltage to the phases of said three phase stator winding of each of said synchronous motors, to rotate said rotors and said load by respective predetermined amounts with each stepped change of said voltage; and, voltage magnitude control feedback means for adjusting the magnitude of said voltage



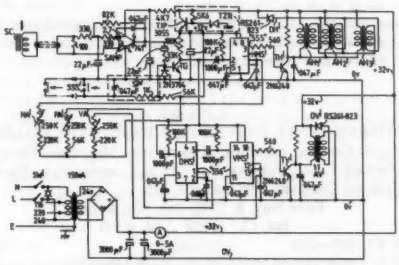
applied to the stator winding as a function of adverse mechanical forces incurred by said gear during rotation of said rotors and said load whereby said adverse mechanical forces are reduced.

4,496,884

VIBRATORY CONVEYOR CONTROL ARRANGEMENT

Arthur Hamer, Oldham, and Beverley H. Pardoe, Manchester, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 244,795, Mar. 17, 1981, Pat. No. 4,441,060. This application Apr. 2, 1984, Ser. No. 595,735
Claims priority, application United Kingdom, Mar. 19, 1980, 8009177
Int. Cl.[3] H00K 53/02
U.S. Cl. 318—114 4 Claims



1. A vibratory conveyor control arrangement for a vibratory conveyor of the type comprising:

a base;

a load-supporting surface defining a load path;

resilient mounting means between said base and the surface to permit vibration of the surface substantially along and normal to said path together with respective first and second driving means energizable to bring about said vibration wherein said control arrangement is included in a closed control loop means to generate a motion signal from the actual vibrational motion of the surface which signal represents at least a component of said motion and means to sense from said component the natural frequency of vibration of the conveyor in one direction and means

responsive to sensed frequency to energize means to maintain vibration at the natural frequency.

4,496,885

POSITIONING CONTROL SYSTEM

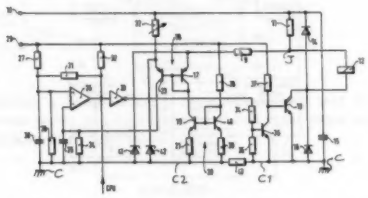
Werner Nitschke, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,505

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225157

Int. Cl.³ H02K *33/00*

U.S. Cl. 318—122 **18 Claims**



1. Positioning control system providing interrupted, plused current to a positioning element **(12)** having

an output controlled semiconductor switch **(13)** connected to control current flow through the positioning element;

a network connected to the control electrode of the controlled semiconductor switch to render said semiconductor switch alternately conductive and non-conductive in accordance with a commanded duty cycle;

and current measuring means **(11)** serially connected with the positioning element **(12)**,

said network including, in accordance with the invention,

a current mirror circuit **(18)** having two current paths **(17, 23)** connected such that current flow through one path **(17)** will be reflected in current flow through the other **(23)**,

said current measuring means **(11)** being connected to one **(17)** of said current mirror circuit paths;

a command element **(22)** providing a command value in form of an electrical current;

and a comparator **(24, 25; 26; 27-32)**, said comparator being connected to the command element **(22)** through the other **(23)** of said current mirror paths.

4,496,886

THREE STATE DRIVER FOR INDUCTIVE LOADS

Gary B. Gordon, Saratoga; Robert Joy, Mountain View, and Michael J. Lee, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 8, 1982, Ser. No. 439,691

Int. Cl.³ H02P *7/06, 6/00*

U.S. Cl. 318—254 **17 Claims**

1. A driver circuit, coupled to a voltage supply, for controlling a load current through an inductive load in response to a voltage command signal representing a desired load current, the driver circuit comprising:

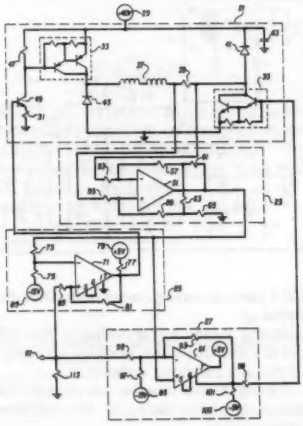
sensing means, coupled to the load, for measuring the load current and for presenting at an output a sense signal representing said load current;

first switch means, coupled between the supply and one end of the load, for selectively coupling the one end of the load to the supply in response to a first control signal;

second switch means, coupled between the supply and an other end of the load, for selectively coupling the other end of the load to the supply in response to a second control signal;

first comparator means, having a first input for receiving the command signal and a second input coupled to the sensing means output for receiving the sense signal, said first comparator means having an output coupled to the first switch means and being operative for comparing the sense signal and the command signal and for selectively presenting a first open control signal or a first short control signal to the first switch means to cause the first switch means to open or short, respectively;

second comparator means, having a first input for receiving the command signal and a second input coupled to the sensing means output for receiving the sense signal, said



second comparator means having an output coupled to the second switch means and being operative for comparing the sense signal and the command signal and for selectively presenting a second open control signal or a second short control signal to the second switch means to cause the second switch means to open or short, respectively;

a first diode having an anode connected to ground and a cathode connected to the one end of the load; and

a second diode having an anode connected to the other end of the load and a cathode connected to the supply.

4,496,887

DIRECT-CURRENT BRUSHLESS MOTOR

Noboru Ichihara, Kasukabe, and Isamu Takehara, Soka, both of Japan, assignors to Japan Servo Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1983, Ser. No. 469,783

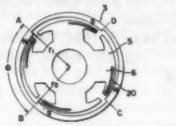
Claims priority, application Japan, Mar. 10, 1982, 57-36652; Mar. 10, 1982, 57-36653; May 13, 1982, 57-79192

Int. Cl.³ H02P *1/18*

U.S. Cl. 318—254 **3 Claims**

3. A DC brushless motor characterized in that it comprises a rotor having a cylindrical permanent magnet with N- and S-poles magnetized alternately around the circumference thereof, circular-arc pole shoes arranged facing said rotor with a gap therebetween, a stator yoke provided with a plurality of radial stator magnetic poles supporting said pole shoes, stator windings wound around each of said stator poles, and an electrification control unit which detects the magnetic flux of the permanent magnet of said rotor and delivers an output based thereon to make a current flow through said windings in sequence to drive said rotor, in that each of said circular-arc pole shoes has therein a narrow groove extending along almost half of the length of the arc from one end thereof near the surface facing said permanent magnet, and said narrow groove is covered with a thin layer portion and in that the permanent

magnet provided for said rotor is constituted in such a manner that the radius of its surface facing the stator varies continuously over the length of arc of each pole from one end thereof to the other.



4,496,888

CONTROL SYSTEM FOR A D.C. MOTOR

Graeme R. Campbell, West Midlands, England, assignor to Lucas Industries Limited, Birmingham, England

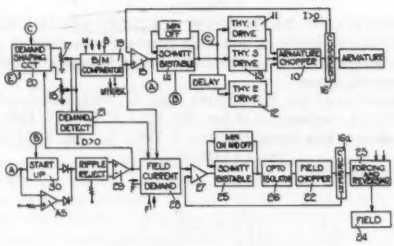
PCT No. PCT/GB78/00046, § 371 Date Jul. 23, 1979, § 102(e) Date Jul. 23, 1979, PCT Pub. No. WO79/00355, PCT Pub. Date Jun. 28, 1979

Continuation of Ser. No. 224,224, Jul. 23, 1979, abandoned. This PCT application Dec. 4, 1978, Ser. No. 454,660

Claims priority, application United Kingdom, Dec. 8, 1977, 51067/77; PCT Int'l. Appl., Dec. 4, 1978, PCT/GB78/00046

Int. Cl.³ H02P *3/12*

U.S. Cl. 318—284 **4 Claims**



1. A control system for a d.c. motor having an armature winding and a field winding, comprising control means for varying connections of said armature winding and/or field winding so as to enable the motor to operate in a plurality of different modes, armature current regulating means connected to vary the armature current, field current regulating means connected to vary the field current and speed interlock means for preventing an operation of said control means demanding a mode change that changes said connections from at least one motor operation enabling mode to at least one other such mode while the motor is running, the speed interlock means being sensitive to voltage across said armature winding, wherein the improvement comprises:

interlock control means which operate to control current in the field winding when said mode change is demanded, said interlock control means controlling said field current regulating means so as sequentially to cause the field winding current to be reduced to substantially zero and then to supply a controlled current pulse to said field winding, the speed interlock means acting to detect the armature voltage during said controlled current pulse.

4,496,889

METHOD OF DIAGNOSING A SERVOMOTOR CONTROL CIRCUIT

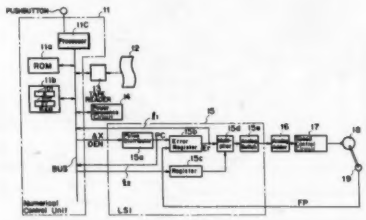
Hiroomi Fukuyama, Hachioji, and Shinichi Isobe, Hino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Nov. 17, 1982, Ser. No. 442,425

Claims priority, application Japan, Nov. 25, 1981, 56-188597

Int. Cl.³ G05B *23/02*

U.S. Cl. 318—565 **8 Claims**



1. A method of diagnosing a servomotor control circuit, before executing numerical processing, including a servomotor, a control unit for providing a numerical value, a pulse distributor, operatively connected to the control unit, for carrying out arithmetic operations for pulse distribution based on the numerical value provided by the control unit, a position detector, operatively connected to the servomotor, for generating a positional pulse each time the servomotor rotates through a predetermined angular interval, an error storage unit, operatively connected to the position detector and the pulse distributor, for computing and storing the difference between the number of positional pulse generated by the position detector and the number of distributed pulses generated by the pulse distributor, and a D/A converter, operatively connected to the error storage unit, for converting the difference into an analog output, the servomotor being controlled by the analog output from the D/A converter, said method comprising the steps of:

(a) supplying the numerical value from the control unit to the pulse distributor to enable the pulse distributor to effect the arithmetic operations while the servomotor is in a de-energized state;

(b) reading a stored content of the error storage unit, supplied with the distributed pulses from the pulse distributor, into the control unit; and

(c) checking the servomotor control circuit for normal and malfunctioning conditions by comparing the stored content, read into the control unit, with the numerical value.

4,496,890

ANTENNA ROTATOR CONTROLLER

Gerard A. Wurdack, Glencoe, Mo., and Gene L. Morgan, St. Clair County, Ill., assignors to Gerard A. Wurdack & Associates, Inc., St. Louis, Mo.

Filed Mar. 11, 1982, Ser. No. 357,071

Int. Cl.³ G05B *19/26*

U.S. Cl. 318—600 **19 Claims**

1. A controller for an antenna rotator having a rotatable member on which is mounted an antenna to be rotated and an electric motor adapted to selectively rotate said member and antenna in either of two opposite directions to a desired heading, said controller comprising:

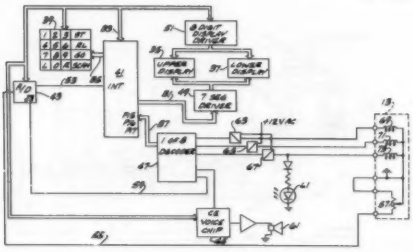
motor switch means for selectively energizing the electric motor to rotate the rotatable member;

user operable means including a plurality of numeric switches for selecting headings;

control means including an electronic memory for storing a plurality of selected headings and for controlling the motor switch means;

user operable means for initiating the storage of selected headings in the memory, the control means being responsive to operation of the heading selecting means and the storage initiating means to store a selected heading in the memory;

a display connected to the control means and responsive to signals therefrom for displaying headings selected by the user; and



user operable means for initiating the rotation of the rotatable member, said control means being responsive to both operation of the rotation initiating means and to the display of either a heading not stored in the memory but selected by actuation of certain numeric switches or to a selected heading retrieved from those previously stored in the memory, thereby to control the motor switch means to rotate the rotatable member to the selected heading displayed.

4,496,891

STEPPING MOTOR CONTROL APPARATUS

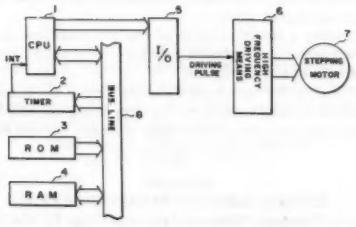
Makoto Kobayashi, Chiba, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,460

Claims priority, application Japan, Aug. 5, 1982, 57/135753

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **7 Claims**



1. A stepping motor control apparatus comprising:

memory means for storing control steps of a stepping motor;

time counting means for counting a plurality of time intervals; and

controlling means for generating a power supply frequency to apply a substantially constant acceleration or deceleration torque to the stepping motor within a first interval counted by said time counting means in accordance with the control steps stored in said memory means, and for generating another power supply frequency to apply an acceleration or deceleration torque which changes as a function of time to the stepping motor within a second time interval counted by said time counting means in accordance with the control steps stored in said memory means.

4,496,892

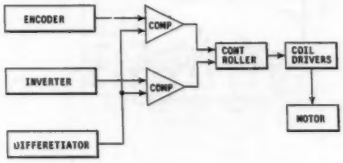
STEPPER MOTOR CONTROLLER

Henry Bugatto, Jr., San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1984, Ser. No. 586,167

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **7 Claims**



1. A method of rapidly converging the position deviation and velocity of a stepper motor to zero at a selected null point comprising the steps of:

predetermining a variable velocity threshold in the form of a slope, where the value at any point is a function of the position such that, for any starting point on said slope, the maintenance of the stepper motor velocity along the indicated slope will result in the stepper motor rapidly and smoothly going to zero as the null point is approached,

comparing the actual velocity to the predetermined velocity at the current position to produce a binary output indicating whether the current velocity is too high or low, and

turning on or off, in response to said binary output, one or more stepper motor coils to drive the actual motor velocity toward the determined value.

4,496,893

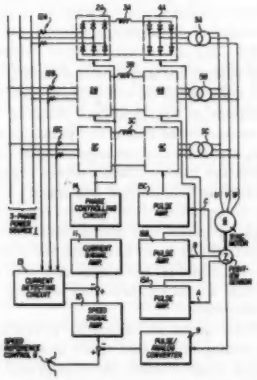
CONTROLLING DEVICE FOR A BRUSHLESS MOTOR

Teruo Nakano, Hachioji, and Akio Hirata, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 333,161, Dec. 21, 1981, abandoned, which is a continuation of Ser. No. 120,126, Feb. 11, 1980, abandoned. This application Jan. 9, 1984, Ser. No. 568,514

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—721 **4 Claims**



1. A controlling device for a brushless motor comprising:

a synchronous motor having a rotor;

a power source and a plurality of unit converting devices which are coupled to the synchronous motor;

means for detecting the rotor position of said synchronous motor and for outputting phase-shifted position signals with respect to the rotation of the synchronous motor, with each one of said outputted phase-shifted position signals being spaced at a pre-determined phase from another one of said outputted phase-shifted position signals;

means for controlling the phase of each of said unit converting devices in response to each of said phase-shifted position signals wherein each of said unit converting devices generates a 3-phase alternating current output;

a plurality of isolation transformers mounted between each unit converting device and said motor; and

combining means for combining the output of each said isolation transformers whereby 3-phase alternating current outputs from each of the unit converting devices shifted at said pre-determined phase are synthesized producing a sine wave approximate staircase current which is supplied to said motor.

4,496,894

ARRANGEMENT FOR CONTROLLABLY DRIVING AN A.C. MOTOR

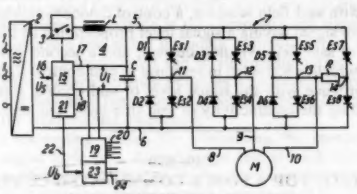
Tom K. Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 16, 1984, Ser. No. 590,507

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1983, 3312897

Int. Cl.³ H02P *3/22*

U.S. Cl. 318—759 **7 Claims**



1. A circuit for controllably driving an A.C. motor, comprising, a regulatable D.C. voltage supply having a pulse modulation regulator, a smoothing circuit forming two supply lines following said regulator, means operating said regulator to maintain a desired voltage between said supply lines, an inverse rectifier having for each phase thereof a pair of controllable load switching elements in series between said supply lines, each of said load switching elements being bridged by a recovery diode, a motor phase connection between said elements of each said pair of elements, a braking circuit including two series connected brake switching elements between said supply lines, a brake resistor between the junction of said brake switching elements and one of said motor phase connections, and switching means responsive to the voltage between said intermediate circuit supply lines to control the frequency of said inverse rectifier and said braking circuit.

4,496,895

UNIVERSAL SINGLE PHASE MOTOR STARTING CONTROL APPARATUS

Keith W. Kawate, N. Attleboro, Mass., and Richard W. Strachan, deceased, late of Providence, R.I. (by Dawne C. Strachan, executrix), assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 9, 1983, Ser. No. 492,537

Int. Cl.³ H02P *1/44*

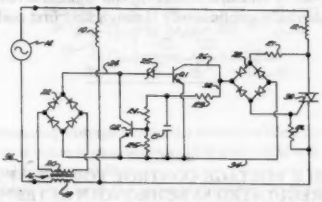
U.S. Cl. 318—781 **15 Claims**

15. A control circuit for controlling the operation of an induction motor having a start winding and a main winding energized by an alternating current energy source and for deenergizing the start winding in response to a phase crossing between the main winding current and the start winding current comprising,

a three terminal solid state switch means having a pair of terminals connectable in series circuit relationship with the start winding and a gate terminal,

pulse generating means connectable to the main winding for producing a narrow pulse each time the main winding current crosses zero,

trigger circuit means for energizing the solid state switch means, the trigger circuit means having a first transistor



coupled to the gate of the solid state switch and adapted to energize the switch when the transistor is conductive, the pulse generating means connected to the first transistor so that a pulse transmitted from the pulse generating means to the first transistor will render it conductive,

lockout circuit means including a second transistor connected in parallel circuit relationship with the first transistor and means responsive to a preselected voltage across the solid state switch means to turn on the second transistor to shunt the pulses from the pulse generating means away from the first transistor thereby preventing the triggering of the solid state switch and deenergizing the start circuit.

4,496,896

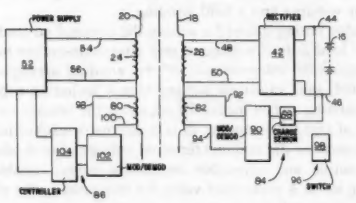
VEHICLE BATTERY CHARGING APPARATUS

Grant C. Melocik, Chardon, and John E. Wible, Painesville, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Apr. 14, 1983, Ser. No. 484,769

Int. Cl.³ H02J *7/04*; H01M *10/46*

U.S. Cl. 320—2 **11 Claims**



1. In an apparatus (10) for delivering electrical energy from a charging station (12) to a vehicle (14), said vehicle (14) including a battery (16) and an attached vechile bumper (18) and said charging station (12) including a source of electrical energy, the improvement comprising:

said charging station (12) having a station bumper (20), said station bumper (20) being ferromagnetic and including a first wire coil (24);

said vehicle bumper (18) being ferromagnetic and including a second wire coil (28), said station and vehicle bumpers

(20,18) forming respective magnetic flux path elements for said first and second wire coils (24,28);

means (30) for positioning said vehicle (14) at a predetermined location relative to said charging station (12), said first and second coils (24,28) being magneticaly coupled by said ferromagnetic bumpers (18,20) in response to said vehicle (14) being positioned at said location; and,

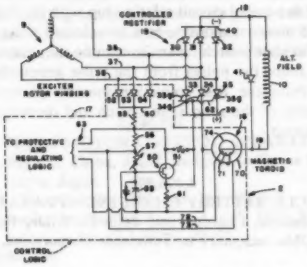
means (34) for sensing the relative position of said first and second coils (24,28) and controllably delivering said electrical energy from said charging station (12) to said vehicle (14) in response to the sensed position, said means (34) including means (60) for producing a signal current having a predetermined frequency and delivering said signal current to said first coil (24), said signal current flowing substantially continuously through said first coil (24).

4,496,897

VARIABLE VOLTAGE CONTROL FOR SELF-EXCITED SELF-REGULATED SYNCHRONOUS ALTERNATOR

Lewis E. Unnewehr; Robert B. Walker, and Andrew F. Szippl, all of Lima, Ohio, assignors to Lima Electric Co., Inc., Lima, Ohio

Filed Nov. 12, 1981, Ser. No. 320,723
Int. Cl.³ H02P *9/30*
U.S. Cl. 322—25 **16 Claims**



1. An electric generating device comprising:

an alternator-exciter means for producing an electrical output, said alternator-exciter means including an exciter rotor winding and a field winding,

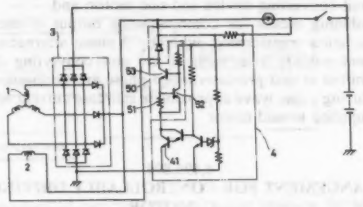
adjustable setting means for setting the nominal no load and light load output voltage of said alternator-exciter means substantially independently of the winding arrangement thereof, said adjustable setting means including a phase modulating circuit means for adjusting the voltage excitation of said field winding of said alternator-exciter means to determine the nominal terminal voltage of such electrical output and adjustable impedance means capable of being set to a prescribed value for determining the phase delay timing for said phase modulating circuit means in timed relation with such output voltage and substantially independently of the magnitude of such output voltage, said phase modulating circuit means comprising a controlled bridge and timing means for controlling operation of said controlled bridge in direct proportion to the open circuit voltage across at least part of said controlled bridge, said adjustable impedance means being coupled to said timing means to set the phase delay according to the proportion of such open circuit voltage required to effect conduction in said controlled bridge.

4,496,898

VEHICLE A.C. GENERATOR WITH CONSTANT OUTPUT POWER

Yoshiyuki Iwaki; Mitsuyoshi Yokota, and Akio Matsumoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,710
Claims priority, application Japan, Oct. 20, 1982, 57/159874[U]; Oct. 20, 1982, 57/159876[U]
Int. Cl.³ H02J *7/14;* **H02P** *9/30*
U.S. Cl. 322—34 **2 Claims**



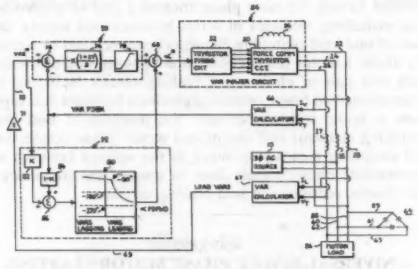
1. An AC generator for a vehicle, comprising; a field winding having a temperature dependent resistance, a stator winding, said stator and field winding being provided for generating AC power, a rectifying apparatus for rectifying said AC power, a voltage control apparatus for interrupting an exciting current flowing into said field winding, and a constant current source further comprising a switching device connected in series with said field winding, a control device which outputs a control signal having a signal level proportional to the magnitude of said field winding current, and a second switching means which is activated in response to said control signal and in accordance with the signal level of said control signal for controlling the conductivity of said first switching means.

4,496,899

CONTROL FOR A FORCE COMMUTATED CURRENT SOURCE VAR GENERATOR

David L. Lippitt, Scotia, N.Y., and Loren H. Walker, Salem, Va., assignors to General Electric Company, Salem, Va.

Filed Jun. 28, 1983, Ser. No. 508,599
Int. Cl.³ H02J *3/18*
U.S. Cl. 323—207 **34 Claims**



1. A control scheme for linearizing the non-linear operational characteristic of a static var generator coupled to a source of alternating current power, comprising:

(a) an inductively loaded force commutated thyristor inverter coupled to said alternating current source and operating as a current source var generator;

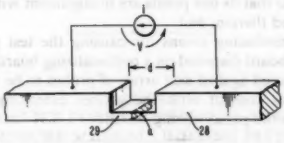
(b) means responsive to a gating angle command signal for controlling thyristor firing angle of said inverter for generating at least leading vars;

(c) means for establishing a var command signal corresponding to a command for vars;
(d) control means having a non-linear signal transfer function for generating a gating angle command signal which is variable in response to said var command signal; and
(e) means coupled to said control means for applying said gating angle command signal to said means for controlling said firing angle of said inverter.

4,496,900
NONLINEARITY DETECTION USING FAULT-GENERATED SECOND HARMONIC

Thomas H. Di Stefano, Bronxville, and Arnold Halperin, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,318
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—51 **5 Claims**



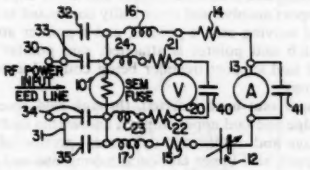
1. Test apparatus for determining the existence of nonlinearity faults in a conductor under test, which conductor is connected by probes to the test apparatus, characterized by:
(a) a test signal generator having a composite test signal node and means to provide at the composite test signal node a composite test signal including a direct current signal of known characteristics and an alternating current signal of known characteristics including a fundamental frequency, and having a fundamental frequency node for providing the fundamental frequency;
(b) connecting means, for connecting the composite test signal node to a device under test in such fashion that nonlinearity anomalies in the device under test provide fault signals including second harmonics of the fundamental frequency;
(c) test signal filtering means, connected to said composite test signal node, to pass only the second harmonic signal from the device under test;
(d) frequency doubling means connected to the fundamental frequency node of said test signal generator to produce second harmonic test signals;
(e) phase detection means having inputs including an input connection from said filtering means for accepting second harmonic signals from the device under test and having further input means for accepting the second harmonic test signals from said frequency doubling means, for detecting fault signals separate from conductor signals differing in phase; and
(f) output means for providing an indication of fault in the device under test.

4,496,901
ELECTROEXPLOSIVES, RF POWER SAFETY MARGIN MEASUREMENT METHOD

M. Nihat Yazar, Nepean, Canada, assignor to Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed May 17, 1982, Ser. No. 379,101
Claims priority, application Canada, Jun. 8, 1981, 379246
Int. Cl.³ G01R *21/04, 35/00*
U.S. Cl. 324—95 **8 Claims**

1. A method of measuring the effective power absorbed by a resistive device due to radio-frequency energy induced in an electrical line connected to the device, comprising:
(a) connecting an adjustable source of constant dc current to the device in series with an ammeter and connecting a voltmeter across said device;
(b) passing current of varying levels through said device while measuring the current through it and the voltage across it,
(c) recording voltage versus dc current for said device from the current and voltage measurements obtained in step (b);

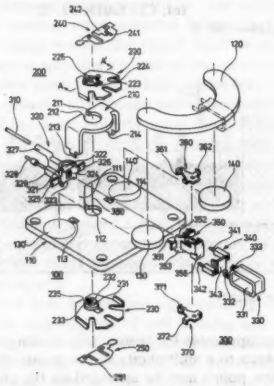


(d) measuring voltage across the device while a dc current of known value is passed through it and while it is connected to said electrical line,
(e) subtracting from the voltage measured in the step (d) the voltage value obtained in step (c) for said dc current of known value to obtain the voltage produced by radio-frequency energy, said last named voltage being proportional to the effective power absorbed by the device.

4,496,902
TAUT BAND TYPE INSTRUMENT SUITABLE FOR AUTOMATICAL ASSEMBLY

Shigetaka Miura; Junichi Igawa, and Satoru Takata, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed May 13, 1982, Ser. No. 377,711
Claims priority, application Japan, May 20, 1981, 56-75037
Int. Cl.³ G01R *5/02, 5/08*
U.S. Cl. 324—150 **2 Claims**



1. A taut band type instrument suitable for being automatically assembled, comprising
an exciting unit comprising a yoke having a hole defined therein, said hole communicating with an exterior through a recess, a pair of permanent magnets attached to said yoke and spaced from each other across said hole, and a semi-annular core attached to said pair of permanent magnets;
a bridge unit comprising a channel shaped bridge having a hole defined therein, said hole communicating with an exterior through a recess, said channel shaped bridge being attached to said yoke, upper and lower stoppers,

each of said stoppers having a cylindrical portion communicating with an exterior through a recess, one of said stoppers being mounted in said hole in said bridge and the other stopper being mounted in said hole in said yoke, and upper and lower tension springs having tongues, respectively, and attached to said upper and lower stoppers, respectively;

a moving unit comprising a moving coil disposed angularly movably about said core, a support member to which said moving coil is attached, upper and lower clips fixed to said support member and electrically connected to terminals of said moving coil, a pointer, and a pointer attachment to which said pointer is attached, said pointer attachment and said support member being coupled at end surfaces thereof;

an upper taut band inserted, through said recesses in said bridge and said upper stopper, and within said hole of said bridge and within said cylindrical portion of said upper stopper, said upper taut band having one end attached to said upper tension spring through said tongue thereof and an opposite end attached to said upper clip;

a lower taut band inserted, through said recesses in said yoke and said lower stopper, and within said hole of said yoke and within said cylindrical portion of said lower stopper, said lower taut band having one end attached to said lower tension spring through said tongue thereof and an opposite end attached to said lower clip, said upper and lower taut band coacted with each other to support said moving coil under tension between said upper and lower tension springs;

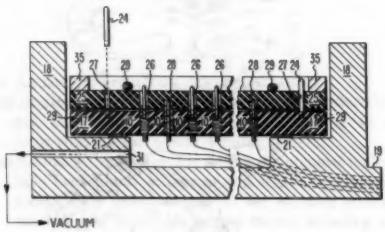
whereby said pointer is angularly moved through an angular interval dependent on current to be measured, said current flowing through said moving coil, under coaction of a magnetic flux from said permanent magnets and said current to be measured.

4,496,903

CIRCUIT BOARD TEST FIXTURE

Ronald A. Paulinski, Goleta, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 11, 1981, Ser. No. 262,638
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—158 F **9 Claims**



1. In test apparatus for temporarily making individual electrical contacts to a multiplicity of test points of a circuit board wherein test points may be arranged on the circuit board in a plurality of different possible planar patterns, the combination comprising:

means providing a planar member containing an array of contact probes of sufficient number and arrangement to accommodate said plurality of different possible patterns of test points, each of said probes being resiliently urged in a like predetermined direction perpendicular to said member and extending therefrom;

a plurality of personalizing boards, one for each different type of test point pattern which may be provided for a circuit board to be tested by said apparatus, each personalizing board having a predetermined pattern of holes provided therein corresponding to the test point pattern of the respective circuit board to be tested thereby, each hole being of appropriate size for receiving one of said contact probes;

means providing for the disposing of one side of a personalizing board adjacent and parallel to said array of probes such that the array of holes in the personalizing board are in alignment with and receive corresponding ones of said probes;

means for mechanically forcing a personalizing board against said array of probes so that the probes which are not in alignment with holes in said personalizing board are depressed while the probes received by said holes remain undepressed, the thickness of said personalizing board being chosen relative to the length of said probes so that the undepressed probes are able to extend beyond the other side of the personalizing board after the personalizing board is mechanically forced against said probes;

means providing for the disposing of a circuit board to be tested by said apparatus on a corresponding personalizing board so that its test points are in alignment with the holes provided therein; and

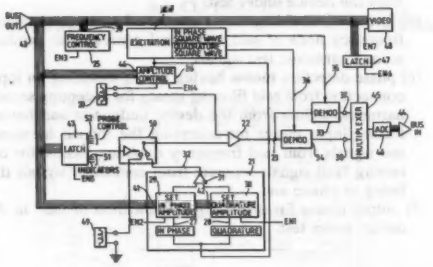
vacuum producing means for causing the test points of a circuit board disposed on a personalizing board which has been forced against said array of probes to be forced into electrical contact with the probes extending from the holes in the personalizing board.

4,496,904

EDDY CURRENT MEASUREMENT APPARATUS FOR NON-DESTRUCTIVE TESTING IN THE VICINITY OF A FASTENER

David J. Harrison, Farnham, England, assignor to The Secretary of State for Defence in her Britannic Majesty's Government of The United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB81/00089, § 371 Date Dec. 31, 1981, § 102(e) Date Dec. 31, 1981, PCT Pub. No. WO81/03381, PCT Pub. Date Nov. 26, 1981
PCT Filed May 19, 1981, Ser. No. 336,341
Claims priority, application United Kingdom, May 22, 1980, 8016887
Int. Cl.³ G01N *27/72*; G01R *33/00*; G01N *27/82*
U.S. Cl. 324—227 **2 Claims**



1. An eddy current measurement apparatus for non-destructive testing in the vicinity of a fastener, comprising:

a probe having first and second transducer coils structurally mounted in opposition on a rotatable former, said transducer coils providing output signals in response to excitation;

means for exciting said coils;

means for rotating said probe;

difference amplifier means having first and second inputs and an output providing a first signal for measurement during rotation of said coils and a second signal indicating a centering error signal during rotation of said coils,

said output of said first transducer coil being connected to said first input of said difference amplifier means;

a signal generator providing a reference level signal;

switch means having a first state and a second state arranged such that in said first state said second transducer coil output is connected to said second input of said difference amplifier means and such that in said second state said output of said signal generator is connected to said second input and said second transducer coil is disconnected from said second input;

control means for actuating said switch means into said first state during probe centering rotation so that said difference amplifier produces said center erroring signal and for actuating said switch means into said second state during a subsequent measurement;

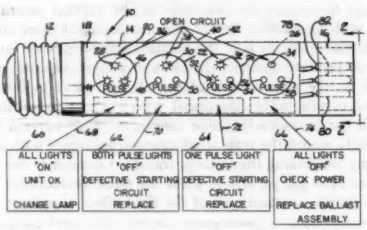
said control means being arranged to repeat said centering rotation if said centering error signal at the output of said difference amplifier means indicates a centering error.

4,496,905

TESTING DEVICE FOR ELECTRICALLY ANALYZING A HIGH PRESSURE SODIUM LIGHTING FIXTURE AND LAMP

Don A. Forte, and Michael L. Thompson, both of Newark, Ohio, assignors to Manville Service Coporation, Denver, Colo.

Filed Aug. 17, 1981, Ser. No. 293,750
Int. Cl.³ G01R *31/024, 31/22*
U.S. Cl. 324—414 **13 Claims**


OPEN CIRCUIT
PULSE
PULSE
PULSE
PULSE
ALL LIGHTS "ON" UNIT OK CHANGE LAMP
BOTH PULSE LIGHTS "OFF" DEFECTIVE STARTING CIRCUIT REPLACE
ONE PULSE LIGHT "OFF" DEFECTIVE STARTING CIRCUIT REPLACE
ALL LIGHTS "OFF" CHECK POWER REPLACE BALLAST ASSEMBLY

1. A testing device for electrically analyzing a high pressure sodium lighting fixture comprising:

a testing receptacle for containing a plurality of indicating lights and an electrical circuit, the receptacle containing an electrical socket sized to fit the socket of said high pressure sodium lighting fixture;

a plurality of electrical analyzing circuits having indicating lights contained therein, the circuits being contained within said testing receptacle and electrically connected to the electrical socket so that an open circuit voltage can be applied to said circuits through said electrical socket;

said circuits being designed to analyze components of said high pressure sodium lighting fixture for a defective starter circuit or a defective ballast and capacitor to give a visual indication on said indicating lights which of said components is defective; and

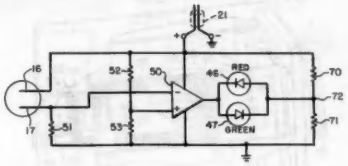
said electrical analyzing circuits including pulse indicating means for sensing a predetermined amplitude of a pulse on each positive and negative half cycle of a wave form and visually indicating the presence thereof on said indicating lights and open circuit voltage amplitude indicating means for sensing the predetermined amplitude of applied open circuit voltage and visually indicating the presence thereof.

4,496,906

LIQUID CONDUCTIVITY MONITOR

Robert A. Clack, Monona, Wis., assignor to Clack Corporation, Windsor, Wis.

Filed Oct. 28, 1981, Ser. No. 315,737
Int. Cl.³ G01N *27/02*
U.S. Cl. 324—439 **12 Claims**



9. A monitoring device for monitoring electrical conductivity in a liquid within a conduit flow system including an aperture in the wall thereof, said monitoring device comprising, in combination:

an elongated housing dimensioned at one end to fit through the aperture in the conduit;

a pair of spaced-apart conductivity-sensing electrodes arranged at the one end of the housing for immersion in the liquid when the one end of the housing is fitted through the aperture;

comparison amplifier means within the housing having first and second input terminals and an output terminal, said first input terminal being coupled to said sensing electrodes, said second input terminal being coupled to a reference voltage source, the signal level developed by said comparison amplifier on said output terminal changing from a first predetermined logic signal level of a predetermined polarity to a second predetermined logic signal level of the same polarity upon the conduction between said electrodes exceeding a predetermined threshold level dependent on said reference voltage source;

supply current means including a supply current source and a voltage divider comprising at least first and second resistance elements serially connected between said supply current source and ground, the juncture of said first and second resistance elements comprising a reference current source; and

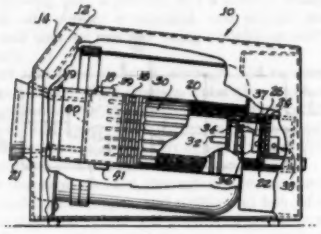
means including first and second light-emitting diodes arranged at the opposite end of said housing and viewable from the exterior thereof, said diodes being independently and directly connected between said reference current source and said output terminal, and being oppositely poled relative to said output terminal whereby said first light-emitting diode is forward biased to light when said output terminal is at said first predetermined logic level, and to not light when said output terminal is at said second predetermined logic level, to indicate conductivity in the liquid is below said predetermined threshold level, and said second light-emitting diode is forward biased to light when said output terminal is at said second predetermined logic signal level, and to not light when said output terminal is at said first predetermined logic signal level, to indicate conductivity in the liquid is above said predetermined threshold level.

4,496,907

METHOD AND APPARATUS FOR NON-DESTRUCTIVELY DETERMINING INGREDIENTS OF A SAMPLE

David B. Funk, Auburn; James D. Kallmeyer, Glenarm, both of Ill., and Wesley H. Harker, Scottsdale, Ariz., assignors to Dickey-John Corporation, Auburn, Ill.

Filed May 6, 1982, Ser. No. 375,552
Int. Cl.³ G01N *27/02*
U.S. Cl. 324—445 **40 Claims**



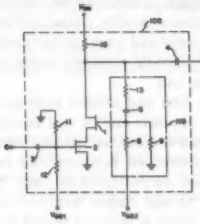
39. A test apparatus for measuring the amount of at least one constituent present in a sample of material, wherein said at least one constituent bears a known relationship to the electrical conductivity of the sample, comprising: a sensor including receptacle means for receiving a sample of material therein and defining an axis, and field producing means, said field producing means including means for producing an electromagnetic field within said receptacle, means for substantially confining said electromagnetic field to a predetermined, fixed volume within said receptacle means and substantially coaxially therewith, means for producing a substantially constant magnitude electromagnetic field throughout said predetermined, fixed volume, and wherein said field producing means further includes means for substantially eliminating axial electric field components in said electromagnetic field.

4,496,908

NEGATIVE FEEDBACK AMPLIFIER HAVING GAAS FET'S

Isamu Takano, and Norihisa Ohta, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 387,810
Claims priority, application Japan, Jun. 16, 1981, 56/92514
Int. Cl.³ H03F *3/16, 1/34*
U.S. Cl. 330—277 **11 Claims**



1. A negative feedback amplifier comprising:

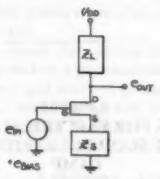
an amplifying section including a first GaAs FET coupled in an amplifier configuration and having source, gate, and drain electrodes; a second GaAs FET coupled in an amplifier configuration and having source, gate and drain electrodes; the drain electrode of said second GaAs FET being connected to the source electrode of the first GaAs FET; an input terminal connected to the gate electrode of either one of the first and second GaAs FET's; an output terminal connected to the drain electrode of the first GaAs FET; and a feedback circuit coupled between the drain and the gate of the other of said GaAs FET's for feeding back a part of the output given from the drain to the gate electrodes of the other GaAs FET of said first and second FET's.

4,496,909

BIASING METHOD FOR IMPROVED PERFORMANCE IN FIELD EFFECT DEVICES

Richard P. Knapp, Hermosa Beach, Calif., assignor to Lawrence Kavanau, Long Beach, Calif., a part interest

Continuation of Ser. No. 170,124, Jul. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 004,572, Jan. 18, 1979, Pat. No. 4,241,316. This application Feb. 28, 1983, Ser. No. 470,522
Int. Cl.³ H03F *3/16*
U.S. Cl. 330—277 **5 Claims**



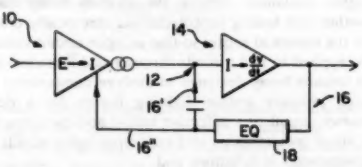
1. A method of minimizing transistor by noise, the field effect transistor having a gate, source and drain comprising setting the quiescent bias point of the field effect transistor by setting the gate to source voltage and the drain to source voltage to operate the transistor in the current saturation region with an electric field in a drain depletion zone such that the carrier velocity is in the partial carrier velocity saturation zone to provide a carrier drift velocity approximately proportional to the square root of the electric field to distort the output conductance functional with current to substantially match the transconductance functional with current to substantially match the transconductance functional with current, thereby linearizing the voltage transfer function of the device, defined $A_v = g_m/g_o$, where g_m is the transconductance and go is the output conductance of the field effect transistor.

4,496,910

PRE-AMPLIFIER HAVING IMPROVED SONIC PERFORMANCE

James C. Strickland, 1595 NE. 175th St., N. Miami Beach, Fla. 33162

Filed Jun. 3, 1982, Ser. No. 384,504
Int. Cl.³ H03G *3/10*; H03F *1/34*
U.S. Cl. 330—279 **9 Claims**



1. A preamplifier circuit for amplifying an information carrying voltage input signal in a frequency range that includes the audio frequency spectrum, the input voltage varying in magnitude as a function of its frequency, said preamplifier circuit providing an output the magnitude of which is substantially independent of frequency, said preamplifier circuit comprising:

a first amplifier stage of a transconductive current source type provided with an input port for receiving a voltage varying input signal to be amplified and having an output port of high impedance through which a current flows as a function of the voltage varying input;

a second amplifier stage of the current-to-voltage transreactive type provided with an input port connected to sense the current varying output of said first amplifier and an output to which an output signal is provided, the voltage of which output signal varies as a function of its current varying input; and

feedback loop means including a equalization network means for degeneratively feeding back a portion of the frequency dependent output current and a portion of the output signal voltage to the high impedance output of said first amplifier stage to effect gain control over the second stage, the impedance of the output of the first stage high enough so that the fed back voltage in unaffected by the frequency throughout the audio frequency range.

4,496,911

INTEGRATED AMPLIFIER CIRCUIT

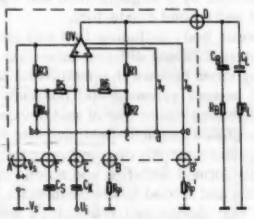
Michael Lenz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,663

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235289

Int. Cl.³ H03F *1/34*

U.S. Cl. 330—297 **8 Claims**



1. Integrated amplifier circuit, comprising a supply potential source, a reference potential source, an operational amplifier having an inverting signal input, a non-inverting signal input, a signal output, an input stage, and internal terminals to be acted upon by the supply potential and the reference potential, a signal input terminal connected to said non-inverting signal input of said operational amplifier, a signal output terminal connected to said signal output of said operational amplifier, a first supply terminal connected to said supply potential source, a second supply terminal connected to said reference potential source, said first and second supply terminals being connected to said internal terminals of said operational amplifier, a first ohmic voltage divider having an end terminal connected to said signal output of said operational amplifier, another end terminal connected to said reference potential source, and a divider point, an ohmic resistor connected between said divider point of said first voltage divider and said inverting signal input of said operational amplifier for obtaining a real negative feedback, a second ohmic voltage divider having an end terminal connected to said first supply terminal, another end terminal connected to said reference potential source, and a divider point, a supply resistor connected between said divider point of said second voltage divider and said non-inverting signal input of said operational amplifier, and a third supply terminal associated with said output stage of said operational amplifier, said third supply terminal being connected to said reference potential source and being insulated from said second supply terminal within the amplifier circuit.

4,496,912

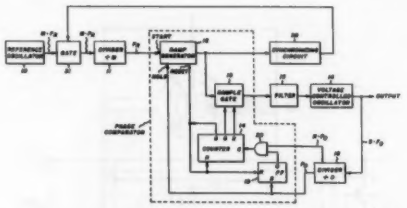
PHASE LOCKED LOOP WITH OSCILLATOR BLOCKING FOR IMPROVED ACQUISITION TIME

Stephen R. Wynn, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jun. 10, 1982, Ser. No. 386,932

Int. Cl.³ H03L *7/06*

U.S. Cl. 331—1 A **25 Claims**



1. In a phase locked loop circuit wherein the phase of a variable frequency repeating signal is compared with the phase of a reference frequency repeating signal, the improvement comprising:

a. a generator for producing a ramp signal which Starts in response to each occurrence of a selected one of said repeating signals;

b. a synchronizing circuit coupled to said generator for producing a blocking signal in response to one of said ramp signals that reach is a predetermined magnitude;

c. and means responsive to said blocking signal for delaying a selected one of said repeating signals following said one ramp signal that reaches said predetermined magnitude.

4,496,913

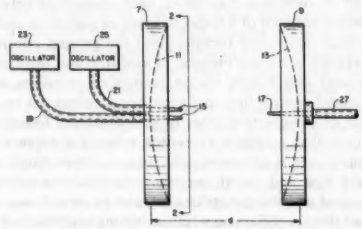
MILLIMETER WAVE POWER COMBINER USING CONCAVE REFLECTORS

Lothar Wandinger, Elberon, and Vahakn Nalbandian, Ocean City, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 24, 1982, Ser. No. 444,136

Int. Cl.³ H03B *5/18, 7/12;* H01P *7/06*

U.S. Cl. 331—56 **10 Claims**



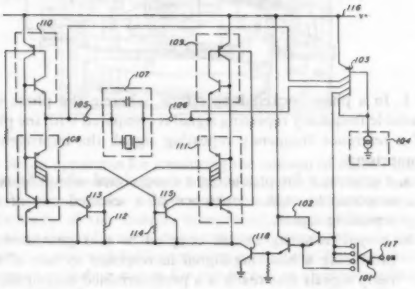
1. A millimeter wavelength power combiner comprising an open resonator comprising a pair of confronting concave reflectors, means to apply the outputs of two or more millimeter wavelength signal sources to said resonator in such a way that the power of the signal sources is combined to form standing waves in the transverse electromagnetic mode along the axis connecting the centers of said reflectors, and means to withdraw the combined power from said resonator.

4,496,914

PIEZO HARN SELF-OSCILLATING DRIVE CIRCUIT

Bernhard H. Andresen, Dallas; Stephen R. Schenck, McKinney, and Nathan R. Kennedy, Sunnyvale, all of Tex., assignors to Texas Instruments Incorporated

Filed Nov. 13, 1981, Ser. No. 321,281
Int. Cl.[3] H03B 5/36
U.S. Cl. 331—110 1 Claim



1. A self-oscillating drive circuit for a piezoelectric transducer, comprising:

a capacitor in parallel with the transducer to prevent harmonic oscillations;

a first silicon controlled rectifier coupled to a first terminal of the transducer and to a power supply voltage;

a second silicon controlled rectifier coupled to a second transducer terminal and to the supply voltage;

a third silicon controlled rectifier coupled to the first transducer terminal and to a ground control line;

a fourth silicon controlled rectifier coupled to the second transducer terminal and to the ground control line;

a pair of switching transistors, each connected between an output element of a respective one of said third and fourth silicon controlled rectifiers and the ground control line, between a control element of said first and third and said second and fourth silicon controlled rectifiers and the ground control line, and each being connected to an output of a respective other of said third and fourth silicon controlled rectifiers to switch when the current in the transducer is approximately zero, to alternatingly switch said first and fourth rectifiers on while switching said second and third rectifiers off, and to switch said second and third rectifiers on while switching said first and fourth rectifiers off;

a transistor switch coupled between the ground control line and ground, said transistor switch being closed upon application of a turn on signal to allow said circuit to oscillate and being open in the absence of a turn on signal to prevent said circuit from oscillating; and

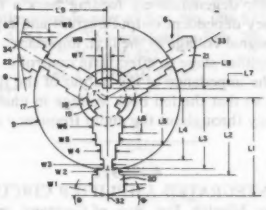
a current source and an I^2L gate connected to said current source and to receive said turn on signal to open said I^2L gate to apply a current from said current source to said transducer to start said circuit in oscillation.

4,496,915

MICROWAVE TRANSMISSION DEVICE HAVING GYROMAGNETIC MATERIALS HAVING DIFFERENT SATURATION MAGNETIZATIONS

Moni G. Mathew, and Thomas J. Weisz, both of Sunnyvale, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 320,740, Nov. 12, 1981, abandoned, and a continuation of Ser. No. 139,816, Apr. 14, 1980, abandoned.
This application Dec. 29, 1983, Ser. No. 566,861
Int. Cl.[3] H01P 1/387
U.S. Cl. 333—1.1 21 Claims



1. A microwave transmission device comprising:

a first conductor disposed in a first plane,

a second conductor disposed in a second plane in parallel relation and spaced from said first conductor for transmitting TEM electromagnetic energy,

a first composite body of gyromagnetic material adapted to be magnetized by a magnetic field and disposed between said first and second conductors,

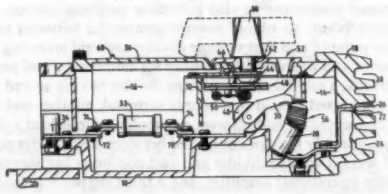
said composite body including first and second gyromagnetic materials having different saturation magnetizations providing broad bandwidth operation for said device, said first and second gyromagnetic materials symmetrically disposed about a center line of said device parallel to the direction of said magnetic field; and said first and second gyromagnetic materials disposed in said device and concentrically formed with first and second diameters establishing first and second ferrite frequencies within the pass band of said device and establishing any subharmonic frequencies outside the pass band of said device thereby to provide operation in a single perfect circulation mode with other perfect circulation modes suppressed.

4,496,916

SWITCH FUSE UNIT

Peter E. G. Carpenter, Newbury, and Andrew P. Baker, Swindon, both of England, assignors to Square D Company, Palatine, Ill.

Filed Jan. 27, 1983, Ser. No. 461,287
Claims priority, application United Kingdom, Mar. 22, 1982, 8208253; Jan. 27, 1983, 8202326
Int. Cl.[3] H01H 85/00; H02B 1/18
U.S. Cl. 337—6 7 Claims



1. A switch fuse unit comprising:

a case of generally rectangular form, the case having a num-

ber of faces, the case being divided into a first compartment and a second compartment, the case also including a hinged door providing access to the second compartment;

an inlet terminal positioned on one of said faces of the case for resilient engagement with a busbar;

two separable switch contacts electrically connected with the inlet terminal;

an outlet terminal positioned on one of said faces of the case;

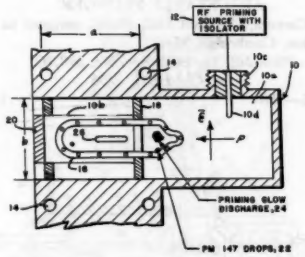
a fuse link positioned within the second compartment, the fuse link being electrically connected in series with the inlet terminal, separable contacts, and outlet terminal; and

a switch operating mechanism positioned within the first compartment, the switch operating mechanism including an external handle, operable to open and close the contacts in a quick-make-and-break manner, the handle being rotatable to an "on" position to block opening of the door, the handle also comprising a first portion secured to the switch operating mechanism and a second portion forming a hand grip, the second portion being hinged to the first portion to allow movement away from the case to permit opening of said hinged door the handle also comprising spring catch means normally preventing such movement but releasable by an implement.

4,496,917
RF-PRIMED HIGH POWER HALOGEN VIAL APPARATUS

Harry Goldie, Randallstown, and William D. Cherry, Beltsville, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 23, 1982, Ser. No. 422,430
Int. Cl.³ H01P *1/14*
U.S. Cl. 333—13 **7 Claims**



1. An RF-primed high power halogen vial apparatus as a radar receiver protector comprising in combination:

a housng member containing a first and second cylindrical guide, said first cylindrical guide being longitudinally aligned with said second cylindrical guide; said second cylindrical guide being in alignment with the input waveguide to said radar receiver,

a vial means positioned within said second cylindrical guide with a small portion extending into said first cylindrical guide, said vial means containing a low pressure gas,

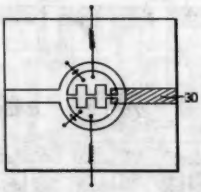
a tuning iris formed in said second cylindrical guide, said tuning iris being substantially centered with respect to said vial means, and

an RF priming means operatively connected to said first cylindrical guide, said RF priming means applying an RF priming signal into said first cylindrical guide by means of a single electrode which is positioned within said first cylindrical guide external to and not in contact with said vial means, said first cylindrical guide propagating said RF priming signal into said vial means to ionize the gas therein and create a weakly-ionized plasma, said plasma providing a source of free electrons to provide a stable breakdown upon receipt of a high microwave signal.

4,496,918
RADIO FREQUENCY ALTERNATE-PATH PHASE SWITCH

William Thorpe, Felixstowe, England, assignor to British Telecommunications, London, England

Filed Jan. 27, 1983, Ser. No. 461,529
Claims priority, application United Kingdom, Feb. 2, 1982, 8202999
Int. Cl.³ H01P *1/185, 3/08;* H03C *3/00*
U.S. Cl. 333—164 **9 Claims**



1. A microwave alternate-path phase switch which provides alternate paths from an input to an output and a selector for selecting which path an input carrier microwave signal will follow from said input to said output, the paths being such that the phase of the output carrier microwave signal depends on the path followed characterized in that the selector comprises:

a primary conducting region;

discrete conductive regions juxtaposed so as to present a low r.f. impedance therebetween for the transmission thereacross of said carrier microwave signal but presenting a high impedance to a lower modulation frequency signal used to select which of said alternate paths is to be used;

each of said discrete regions being connected to said primary conductive region via separate and independent switching means for selecting which of said alternate paths is to be used; and

a gap between each of the discrete regions and the primary conductive region constituting respective ones of said alternate paths.

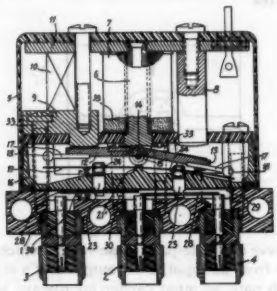
4,496,919
RELAY FOR ULTRA HIGH FREQUENCY COAXIAL SWITCHING

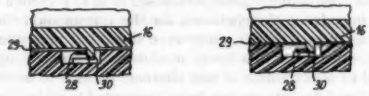
Andre Fournier, La Verpillere, and Gilles Billet, Voiron, both of France, assignors to Microndе, Saint Quentin Fallavier, France

Filed Feb. 24, 1983, Ser. No. 469,261
Claims priority, application France, Feb. 24, 1982, 82 03049
Int. Cl.³ H01H *53/00*
U.S. Cl. 335—5 **10 Claims**

1. A relay for switching high frequency lines comprising, a support, a plurality of spaced apart coaxial contacts on said support, said coaxial contacts comprising a first coaxial contact between a second coaxial contact and a third coaxial contact, first and second rigid blade contacts, a ground plane spaced from said coaxial contacts, a force transmitting insulating pusher fixed to each rigid blade contact, and means for alternately moving said blade contacts from a one position in which said first blade contact engages said first and second coaxial contacts and said second blade contact engages said ground plane, to another position in which said second blade contact engages said first and third coaxial contacts and said first blade contact engages said ground plane, said means comprising a leaf spring connected at its center to a central support, means for connecting said pusher element for said first blade contact to said spring on one side of said central support, means for connecting the pusher for said second blade contact to said leaf spring on the other side of said central support, an armature pivotable about a central axis, said armature having first and second arms projecting in opposite directions from said axis, means at one end of said armature for engaging one end of said

spring, means at the other end of the armature for engaging the other end of said spring, said engaging means being alternately movable with the armature, to a first position in which one of the engaging means engages one end of the leaf spring and deflects the spring to move said first blade contact into engagement with said first and third coaxial contacts, and in which the other engaging means is spaced from the other end of the spring to permit the spring to move the second blade contact





into engagement with the ground plane, and to a second position in which the other engaging means engages the other end of the leaf spring and deflects the spring to move the second blade contact into engagement with the second and third coaxial contacts, and in which said one of the engaging means is spaced from the other end of the spring to permit the spring to move the first blade contact into engagement with the ground plane, and electromagnetic means for pivoting said armature.

4,496,920

ELECTROMAGNETICALLY OPERATED ELECTRIC SWITCH

Karl E. Jönsson, and Gösta Lindgren, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 4, 1983, Ser. No. 482,020

Claims priority, application Sweden, Apr. 6, 1982, 8202209; Apr. 6, 1982, 8202210

Int. Cl.³ H01H *15/00*

U.S. Cl. 335—201 **10 Claims**

1. An electromagnetically operated electric switch comprising

a first fixed contact (9),

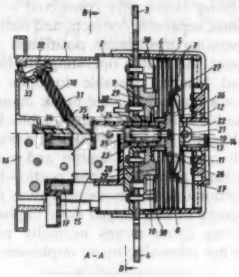
a second fixed contact (10) being disposed at a distance from said first contact,

a movable bridge contact assembly (11, 12) for connecting said first and second fixed contacts,

said bridge contact assembly comprising a movable main contact (11) and a movable arcing contact (12), said movable main and arcing contacts being subjected to separate contact pressure springs (23, 24),

electromagnetic means controlling engagement of said bridge contact assembly with said fixed contacts, said electromagnetic means comprising an electromagnet (16, 17) with an armature (15), and means (14) mechanically connecting said armature to said bridge contact assembly for moving said contact assembly in the same direction as the armature between a closed and an open contact position,

at least one elongated opening spring (18) permanently subjecting said armature to a returning biasing force effective in the opposite direction of the attractive force of the electromagnet, said opening spring being mounted with its longitidinal axis inclined in relation to the direction of



motion of the armature between a first bearing (33), which is fixed, and a second bearing (35) which is displaced together with and in the same direction as the armature, whereby the angle between the longitudinal axis of the spring and the direction of motion of the armature is changed in such a way that said returning force of the opening spring decreases upon attraction of said armature.

4,496,921

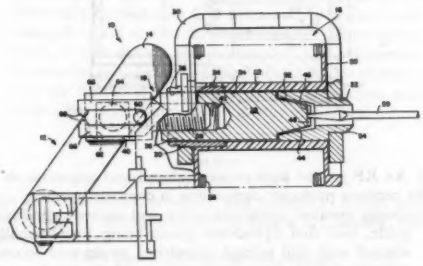
ELECTROMAGNETIC ACTUATOR HAVING ADJUSTABLE PLUNGER

Jacinto P. Carrera, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 15, 1982, Ser. No. 398,760

Int. Cl.³ H01F *7/08*

U.S. Cl. 335—258 **11 Claims**



1. An adjustable electromagnetic actuator operable to control the displacement of a movable workpiece member, said actuator comprising:

a coil assembly including means defining a bore extending at least partially therethrough and having a given axis, and an energizeable field coil at least partially surrounding said bore;

an armature assembly including a plunger disposed in said bore and being movable along said given axis in response to energization of said field coil, said armature assembly including an output assembly which is adapted to be connected to said workpiece member;

means operatively associated with one of said output assembly or said plunger for restraining rotational movement of said one with respect to the other; and,

means connecting said output assembly to said plunger for allowing said plunger and said output assembly to move

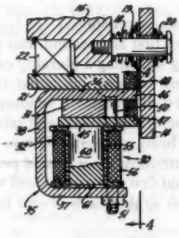
conjointly along the given axis and for allowing relative rotation therebetween when said one cooperates with said restraining means and the other of said plunger or said output assembly is rotated such that they are displaced in relationship to each other along the given axis to thereby allow stroke regulation of said armature assembly said restraining means includes a pair of spaced-apart trapping members connected at one end portion to said coil assembly, and said output assembly includes means for engaging said trapping members, whereby said output assembly cannot rotate such that said output assembly is non-rotational during stroke regulation and also is maintained in a preselected angular orientation for facilitating assembly thereof to said workpiece member.

4,496,922

ELECTROMAGNETICALLY RELEASED COUPLING

James A. Pardee, Janesville, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Dec. 5, 1983, Ser. No. 557,872
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—281 **8 Claims**



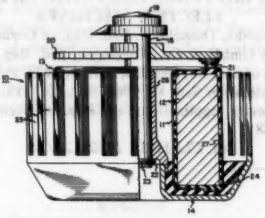
1. An electromagnetic coupling comprising a pair of pole pieces spaced from one another and having pole faces, an armature rotatable relative to said pole pieces and mounted to move axially into and out of frictional engagement with said pole faces, a magnetized permanent magnet located between said pole pieces and polarized to create permanent magnet flux which threads through said magnet in one direction in a working path out of one of said pole faces, through said armature and into the other of said pole faces to attract said armature into engagement with said pole faces, and an annular winding adapted to be selectively energized by a voltage source, said electromagnetic coupling being characterized in that said winding is located between said pole pieces and has a central axis extending substantially perpendicular to said pole pieces, a core made of magnetic material and extending along said axis and through the center of said winding, said core being separated from said permanent magnet by an area of high reluctance and coacting with said pole pieces and said permanent magnet to create a path for winding flux which threads out of said core and into one of said pole pieces, through said permanent magnet and into the other of said pole pieces and then back to said core, said winding being polarized so as to cause said winding flux to flow through said permanent magnet in the same direction as said permanent magnet flux so as to shunt the latter flux from said working path and enable release of said armature from said pole faces when said winding is energized.

4,496,923

ELECTRICAL DEVICE WITH IMPROVED HEAT DISSIPATION

Richard S. Lenzing, Farmington, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Sep. 13, 1982, Ser. No. 417,027
Int. Cl.³ H01F *27/02*
U.S. Cl. 336—59 **2 Claims**



1. In an electrical device of the type having a contact brush in electrical engagement with, and relatively movable with respect to, a coil wound upon a magnetic core and mounted upon a base, the coil being separated from the base by an electrical insulator, and in which the movement of the brush varies the output of the device, the improvement comprising:

(a) employing for the electrical insulator a castable insulating material of relatively high thermal conductivity, so that heat from a hotter portion of the coil may be readily transferred to a cooler portion of the coil and to the base;

(b) employing for the base a relatively deep trough, the outer wall of which axially surrounds the coil and extends laterally over at least a portion of the coil, so that the coil may be placed therein in noncontacting relationship thereto and the castable insulating material may be placed therein, which material will fill at least the space between the coil and the base and will cement the coil to the base; and

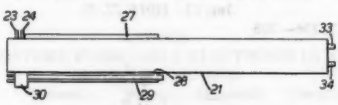
(c) the base further including an extended surface area comprising a plurality of fingers extending from the periphery of the base and spaced so as to allow air to circulate therebetween such that heat transferred from the coil to the base may be readily transferred to the surrounding air.

4,496,924

PULSE TRANSFORMER HAVING CONDUCTIVE SHIELD AROUND MAGNETIC CORE MATERIAL

Robert Richardson, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jul. 27, 1982, Ser. No. 402,344
Claims priority, application United Kingdom, Aug. 8, 1981, 8124320
Int. Cl.³ H01F *15/04*
U.S. Cl. 336—84 R **10 Claims**



1. A transformer, comprising: a core material shaped to constitute a closed magnetic loop; a transformer primary winding and a secondary winding arranged in use to magnetically couple with said core material; and electrically conductive shielding means arranged to surround said core material for shielding it from electric fields associated with the windings, and the shielding means having an electrical discontinuity so that it does not itself constitute a transformer winding; and wherein the core material is loosely mounted within the shield-

ing means to minimize mechanical stress imposed upon the core material; and wherein the primary winding includes a central conductor which is encircled by the core material, and a plurality of studs arranged on a circle lying outside of said secondary winding, at least a major portion of the primary current flowing through said studs.

4,496,925

STEPPED IRON CORE FOR STATIC OR DYNAMIC ELECTRIC MACHINES

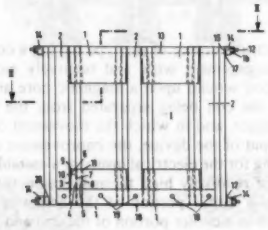
Hugo W. Geschka, Düsseldorf, Fed. Rep. of Germany, assignor to E. Blum GmbH & Co., Valhingen, Fed. Rep. of Germany

Continuation of Ser. No. 091,403, Nov. 6, 1979, abandoned. This application Sep. 17, 1982, Ser. No. 419,395

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848388

Int. Cl.³ H01F *17/06, 27/26*

U.S. Cl. 336—178 **16 Claims**



1. A stepped iron core for a static or dynamic electric machine, such as a transformer, comprising yokes and legs each including stacks of coherent sheet metal laminations and each such stack constituting a portion of a discrete step of the core, the yoke stacks and the leg stacks of each of said steps forming abutment joints and the joints of neighboring steps being staggered with reference to one another, each of said steps providing longer and shorter paths for magnetic force lines; a plurality of clamping means, at least one for each of said steps, for holding together the yoke and leg stacks of the respective steps, each of said clamping means comprising a clamping part and a clamping element disposed between an outer contour of a stack in the respective step and the associated clamping part; and means for achieving a varying magnetic reluctance between the stacks which form said joints so that said longer paths for magnetic force lines extend through the respective joints in the lower magnetic reluctance regions thereof.

4,496,926

MOLDED COIL STRUCTURE

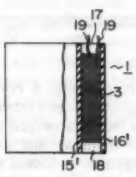
Hirofumi Kubo, and Toshiyuki Fujimori, both of Niigata, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 20, 1982, Ser. No. 370,143

Claims priority, application Japan, Jan. 21, 1981, 56-6399

Int. Cl.³ H01F *27/30*

U.S. Cl. 336—205 **5 Claims**



1. A molded coil structure comprising a coil formed by winding a conductor, a sheet of electrical insulator material respectively wrapped in layers around an inner and an outer periphery of said coil, said layers of insulating material being impregnated with a resin, end-enclosing resin layers covering only end faces of said coil not covered with said layers of insulating material, and a gas charged in an internal space of said coil and sealed therein such that a pressure of the gas is maintained substantially at an atmospheric pressure and the gas uniformly fills the internal space of the coil.

4,496,927

MULTILAYER COIL

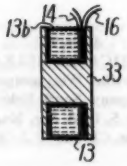
Norikatsu Inoue, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 27, 1982, Ser. No. 402,359

Claims priority, application Japan, Sep. 22, 1981, 56-150010

Int. Cl.³ H01F *27/30*

U.S. Cl. 336—208 **8 Claims**



1. A multilayer coil comprising:

a conductor having first and second lead wires and formed as a coil winding including a plurality of layers providing said coil winding with a substantial thickness with an outer peripheral wall of said coil winding being defined by an outermost one of said layers, and said first and second lead wires both being integrally formed with and extending from said outermost layer of said peripheral wal such that neither of said first and second lead wires crosses over any of said layers so that each of said layers lies substantially flat.

4,496,928

TEMPERATURE RESPONSIVE SWITCH

Walter Hollweck, Nuremberg, Fed. Rep. of Germany, assignor to Thermostat- und Schaltgerätebau GmbH & Co. KG, Bad Kissingen, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 498,901

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219517

Int. Cl.³ H01H *61/08, 37/52*

U.S. Cl. 337—94 **14 Claims**

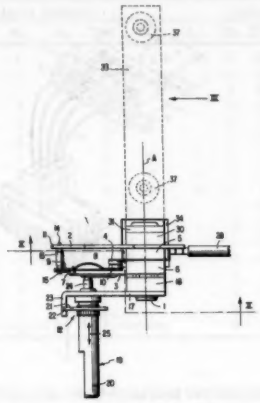
1. A temperature responsive regulator switch for controlling the heat of an electric heating device, comprising:

(a) movable and stationary electric contacts cooperating with one another for assuming open and closed positions;

(b) bimetal means operatively coupled to said movable contact for moving said movable contact into said open position when said bimetal means attains a predetermined temperature; said bimetal means being heated by electric current passing therethrough solely in said closed position;

(c) heat conducting means having a first part adapted to be directly exposed to the heat of the device controlled by the temperature responsive regulator switch and a second part being in a heat-conducting connection with said

bimetal means for heating said bimetal means by the heat generated by the device; and



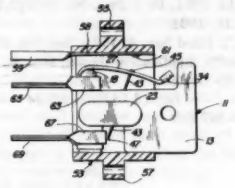
(d) an electric insulating element of Al_2O_3 separating said bimetal means from said heat conducting means.

4,496,929

LOW CURRENT INDICATING FUSE

Angelo Urani, St. Louis, Mo., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Apr. 11, 1983, Ser. No. 483,908
Int. Cl.³ H01H *85/30, 85/16*
U.S. Cl. 337—265 **5 Claims**



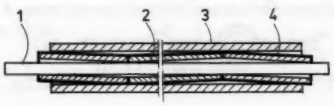
1. An indicating fuse assembly comprising:
a fuse holder;
a first holder terminal secured in said fuse holder;
a fuse carrier mounted in said fuse holder, said fuse carrier having a body member formed of insulating material;
said fuse carrier body including first and second projecting ears;
said first projecting ear having a rounded shoulder formed at the end thereof;
an alarm actuating elongated flexible spring contact, a first end of said spring contact mounted on said first projecting ear;
an indicator mounted on the free end of said spring contact;
a slot formed in said spring contact adjacent said first end thereof to reduce the return spring force exerted by said spring contact when flexed, said slot in said spring contact being generally rectangular in shape;
a first terminal clip secured in said fuse holder to electrically connect with said flexible spring contact the electrical connection between said flexible spring contact and said first terminal clip being made through a resilient generally U-shaped conducting terminal secured to said first projecting ear;
a fixed contact terminal mounted on said second projecting ear and spaced from said spring contact;
a second terminal clip secured in said fuse holder to electrically connect with said fixed contact terminal;
a fusible link extending from said flexible spring contact to said fixed contact terminal to hold said spring contact in a flexed position and providing a conducting path from said fixed contact terminal to said spring contact, the fusing of said fuse link releasing said spring contact to engage said first holder terminal to actuate an alarm and position said indicator for visual observation;
said spring contact passing over said rounded shoulder formed on said first projecting ear to thereby minimize breaking of said spring contact in the event that it is forceably bent over said shoulder; and
said flexible spring contact and said conducting terminal being integrally formed.

4,496,930

IN-LINE FIRE DETECTOR OF A FIRE PROTECTION AND ALARM SYSTEM

Maria Krecisz; Witold Kotlewski, and Krzysztof Bebenkowski, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Filed May 31, 1983, Ser. No. 499,347
Claims priority, application Poland, Aug. 13, 1982, 237897
Int. Cl.³ H01B *7/00, 17/34;* **G01M** *3/16*
U.S. Cl. 338—26 **1 Claim**



1. In a fire detector for a fire protection and alarm system, consisting of an outside cylindrical electrode having the form of a protective tube, an inside cylindrical electrode having the form of a cylindrical rod disposed coaxially within said outside electrode, with an electric insulator therebetween, the improvements being characterized in that said insulator comprises short segments of a ceramic pipe disposed end-to-end in the space between the inside electrode and the outside electrode said inside electrode together with said electric insulator segments coated with a thin salt-based layer and disposed in the interior of said outside electrode so that between said electric insulator segments and the internal wall of the outside electrode along the length of the detector an air space is formed, and the electric insulator segments each providing a point-type contact between the internal wall of said outside electrode and the thin salt-based layer.

4,496,931

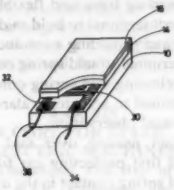
MOISTURE PERMEABLE ELECTRODE IN A MOISTURE SENSOR

Masanori Watanabe, Tenri; Hisatoshi Furubayashi, Yamatokoriyama; Junichi Tanaka, Tenri, and Masaya Hijikigawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 16, 1984, Ser. No. 590,343
Claims priority, application Japan, Mar. 23, 1983, 58-49150
Int. Cl.³ H01L *7/00;* **H01G** *5/20*
U.S. Cl. 338—34 **7 Claims**

1. A thin-film moisture sensor comprising:
a substrate;
a bottom electrode metal layer formed on said substrate;

a moisture sensitive polymer film formed on said bottom electrode layer; and



a moisture permeable indium (In) thin-film formed on said moisture sensitive polymer film.

4,496,932

CURRENT DIVIDER FOR CURRENT MEASUREMENT IN CONJUNCTION WITH A MEASUREMENT TRANSDUCER

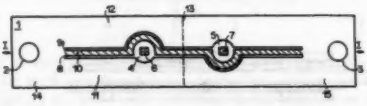
Mathis Halder, Baar, Switzerland, assignor to Lgz Landis & Gyr Zug Ag, Zug, Switzerland

Filed Apr. 16, 1984, Ser. No. 600,521

Claims priority, application Switzerland, Apr. 25, 1983, 2197/83

Int. Cl.³ H01F *40/06*; G01R *15/02*

U.S. Cl. 338—49 **10 Claims**



1. A current divider, for use in connection with a measurement transducer, and wherein the measurement transducer includes a magnetic core,

comprising in combination

a substantially flat and longitudinal current conductor having at least two longitudinal slits, thereby partitioning the flat conductor into at least a measurement conductor and at least two shunts connected in parallel with the measurement conductor, said shunts defining a plane,

said measurement conductor being disposed in said plane and between said shunts,

said flat conductor having two openings along the longitudinal direction, said openings being adapted to receive said magnetic core, one slit communicating with one opening, the other slit communicating with the other opening.

4,496,933

COOLED RESISTOR PACK FOR BRUSH WITH INDIVIDUALLY INSULATED STRANDS

Donald G. Martin, Penn Township, Allegheny County, and Donald M. York, Gibsonia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1984, Ser. No. 584,173

Int. Cl.³ H01C *1/82*

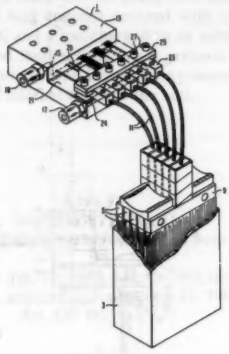
U.S. Cl. 338—55 **8 Claims**

1. The combination of a cooled resistor pack and brushes having a plurality of multi-strand segments insulated from each other, said combination comprising:

a conductive block having ducts cooperatively associated therewith to remove heat therefrom;

a plurality of connectors mechanically fastened to said block and electrically insulated therefrom;

wires having high resistivity electrically connecting said conductors to said block; and



a highly conductive lead electrically connecting each of the brush segments to a separate connector.

4,496,934

ENCODING AND DECODING SYSTEMS FOR BINARY DATA

Teruo Furukawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

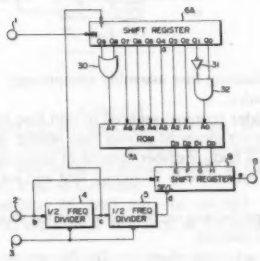
PCT No. PCT/JP81/00218, § 371 Date Feb. 11, 1982, § 102(e) Date Feb. 11, 1982, PCT Pub. No. WO82/00905, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 4, 1981, Ser. No. 355,559

Claims priority, application Japan, Sep. 5, 1980, 55-124459; Sep. 5, 1980, 55-124460

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **7 Claims**



1. A binary data encoding system comprising:

a data input for receiving serial binary data to be encoded;

a clock input for receiving a digital clock signal;

a reset signal input for receiving a reset signal;

a serial to parallel shift register having a data input connected to said binary input and having eight outputs which are designated Q_0–Q_7;

a read only memory having eight inputs which are designated A_0–A_7 and which are aperatively respectively connected to said eight outputs of said serial to parallel shift register and having four outputs which are designated D_0–D_3, wherein said read only memory has the following characteristics:

Input Address								Output Pattern			
A_0	A_1	A_2	A_3	A_4	A_5	A_6	A_7	D_0	D_1	D_2	D_3
1	1	1	1				1	1	0	0	0
0	0	1	1					1	0	0	0
		0	1					0	0	1	0
0	0	1	0	0	0			0	1	0	0
0	1	1	0	0	0			0	1	0	0
1	1	1	0	0	0			0	1	0	0
0	0	1	0	1	0	0	0	0	1	0	0
0	1	1	0	1	0	0	0	0	1	0	0
1	1	1	0	1	0	0	0	0	1	0	0
1	1	1	0			Z		1	0	0	1
0	0	1	0			Z		1	0	0	1
0	1	1	0			Z		0	0	0	1
1	0	1	0			R		0	0	0	1
0	0	0	0					0	1	0	0
0	1	0	0					0	1	0	0
1	1	0	0					0	1	0	0
Addresses Except for the Foregoing								0	0	0	0

wherein

Z: all addresses A_4 to A_7 satisfying the inequalities: "A_4A_5"≠"00" and "$A_4A_5A_6A_7$"≠"1000"

R: all addresses A_4 to A_7 satisfying the inequality: "$A_4A_5A_6A_7$"≠"1000"

and portions with the diagonal lines can have any value;

a parallel to serial shift register having four inputs which are designated E–H and which are respectively operatively connected to said four outputs of said read only memory and having an output comprising an output of said binary data encoding system and having a shift clock input operatively connected to said clock input;

a first frequency divider having its input connected to said clock input and having its output connected to a shift clock input of said serial to parallel shift register and having a reset input connected to said reset input, said first frequency divider dividing the frequency of said digital clock signal by a factor of two;

a second frequency divider whose input is operatively connected to said output of said first frequency divider and whose output is connected to a shift/latch input of said parallel to serial shift register and having a reset input operatively connected to said reset input of said system, said second frequency divider dividing the frequency of a signal input thereto by a factor of two.

4,496,935

ANALOG-DIGITAL CONVERTER WITH LINEAR CHARACTERISTIC RESTORATION CIRCUIT

Michihiro Inoue, Ikoma; Akira Matsuzawa, Katano, and Toyoki Takemoto, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 15, 1982, Ser. No. 368,814

Claims priority, application Japan, Feb. 12, 1982, 57-21434

Int. Cl.³ H03K *13/175*

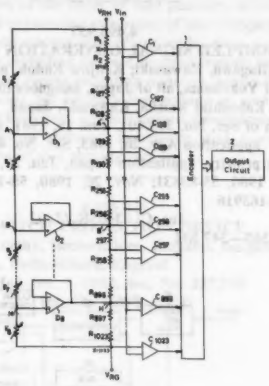
U.S. Cl. 340—347 AD **5 Claims**

1. In a parallel type analog-digital converter having a plural number of comparators, a first voltage divider comprising a plural number of resistors connected in series across voltage feeding terminals thereby to feed divided voltages as reference voltages from junction points between the resistors to said comparators, said converter further comprising:

a second voltage divider comprising a plural number of resistors connected in series across said voltage feeding terminals for feeding divided voltages from junction points between the resistors, each junction point of said second voltage divider corresponding to selected ones of the junction points of said first voltage divider so that the corresponding junction points of the first voltage divider divide the first voltage divider into equal parts,

said second voltage divider being connected in parallel with said first voltage divider,

current amplifiers for feeding compensation currents to said selected ones of the junction points of said first voltage divider thereby to equalize voltages of said junction points



of said first voltage divider with the voltages of corresponding junction points of said second voltage divider.

4,496,936

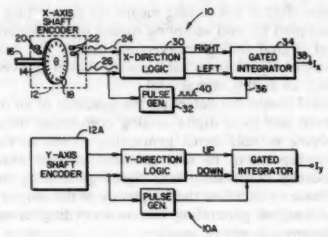
DIGITAL-ANALOG CONVERSION FOR SHAFT ENCODERS

Dan H. Kramer, Sunnyvale, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Jun. 4, 1982, Ser. No. 385,134

Int. Cl.³ H03K *13/00*

U.S. Cl. 340—347 P **13 Claims**



1. In a system including a shaft rotatable about a longitudinal axis in a first and a second direction and a shaft encoder coupled thereto, apparatus for converting a pair of signals produced by the shaft encoder to an analog signal that is indicative of the direction and a rate of rotation of the shaft, each one of the signals comprising a stream of pulses, the pulses of a one of the pair of the signals being shifted in phase relative to the pulses of the other of the pair of signals to indicate direction of rotation, the apparatus comprising:

comparing means adapted to receive said signals and being responsive thereto for providing a binary signal indicative of the direction of rotation;

pulse means adapted to receive the one of the pair of signals for providing therefrom a pulse train comprising a plurality of digital pulses of a fixed pulse width, one digital pulse corresponding to each of the pulses contained in the one signal; and

circuit means responsive to the binary signal and the digital pulse train for integrating the pulse train in response to the first direction of rotation of the shaft and for inverting and integrating the inverted form of the pulse train in response to a second direction of rotation of the shaft, the circuit

means including means for forming the analog signal from the integration of the pulse train.

4,496,937

SAMPLED SIGNAL GENERATION CIRCUIT

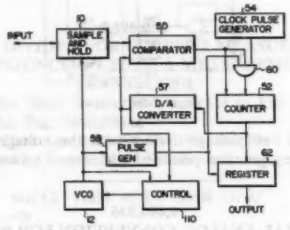
Kazuo Kitagawa, Kawasaki; Kenjiro Endoh, and Hideshi Kira, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 273,401, Jun. 15, 1981, abandoned. This application Apr. 20, 1983, Ser. No. 485,135

Claims priority, application Japan, Jun. 20, 1980, 55-83830; Jun. 20, 1980, 55-83831; Nov. 20, 1980, 55-163912; Nov. 20, 1980, 55-163916

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 SH **4 Claims**



1. An analog-digital converting circuit comprising:

signal generating means for producing an output signal with a frequency variable according to a control signal;

samping means for sampling an analog input signal in response to the output signal from said signal generating means;

analog-digital converting means for converting analog data sampled by said sampling means into a digital signal;

local digital-analog converting means for converting an output signal from said analog-digital converting means into an analog signal; and

control means for detecting the gradient of an output signal from said local digital-analog converting means and supplying to said signal generating means an output signal corresponding to said gradient as said control signal, thereby controlling said signal generating means to increase or decrease the frequency of the output signal from said signal generating means according as said gradient becomes larger or smaller.

4,496,938

DROWSINESS ALARM SYSTEM FOR A VEHICLE

Yasutoshi Seko, Yokohama; Takayuki Yanagishima, and Masami Inoue, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 1, 1981, Ser. No. 326,392

Claims priority, application Japan, Jun. 13, 1979, 54-74189

Int. Cl.³ G02B *21/00*

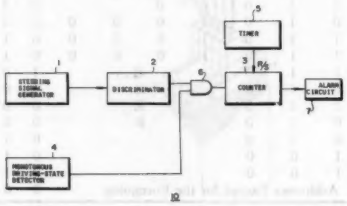
U.S. Cl. 340—576 **10 Claims**

1. A drowsiness alarm system for a vehicle having an alarm circuit which produces an alarm for a driver in response to a pulse signal inputted thereto, comprising:

(a) a steering signal generator which outputs a steering signal having a voltage level representative of an angular position of a steering wheel with respect to an equilibrium point thereof;

(b) a monotonous driving-state detector which detects and signals that the vehicle is traveling in a monotonous driving state;

(c) a discriminator, connected to said steering signal generator, for comparing the voltage level of the steering signal fed from said steering signal generator with a first predetermined reference voltage level (V_{1REF}), and with a second predetermined reference voltage level (V_{2REF}), and for outputting a pulse signal when the voltage level of the steering signal exceeds the second predetermined reference voltage level within a first predetermined period of time from the time when the steering voltage level exceeds the first predetermined reference voltage level; and



(d) an alarm pulse output circuit responsive to the output pulse signal from said discriminator and the detection signal from said monotonous driving-state detector, which provides an alarm pulse to the alarm circuit when the number of pulse signals fed from said discriminator exceeds a predetermined number within a second predetermined period of time.

4,496,939

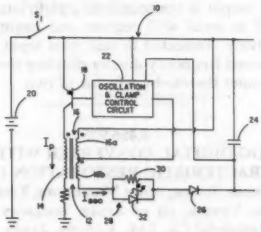
POWER INDICATOR APPARATUS FOR A DC TO DC FLYBACK CONVERTER

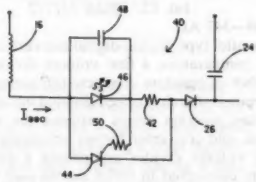
Gregory O. Moberg, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 4, 1982, Ser. No. 384,858

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—636 **13 Claims**





1. In a battery power indicator apparatus for a DC to DC flyback converter having an input energizable by a battery and an output connectable for supplying to a load an amount of energy that is functionally related to the power-delivery capability of the battery, the improvement comprising:

current-sensitive means connected in parallel with voltage-sensitive indicator means, the combination of said current-

sensitive means and said indicator means being serially connected between the output of the converter and its load for passage of a pulsed output current from the DC to DC converter to the load during an energy transfer phase of the converter, said current-sensitive means being adapted to produce a control voltage that is functionally related to the output current and that causes said indicator means (1) to indicate acceptable battery power for operating the DC to DC converter when the amplitude of the output current is above a preselected level, and (2) to indicate unacceptable battery power when the amplitude of the current is below the preselected level.

5. Power indicator apparatus for DC to DC flyback converter arranged to be energized by a storage battery, the converter including a transformer having a primary winding through which current supplied by the battery flows and a secondary winding, said power indicator apparatus comprising:

an illumination source and a resistor connected in series to the secondary winding of the transformer, said illumination source having a first condition for indicating an acceptable power capability of the battery and a second condition for indicating a nonacceptable power capability of the battery, and

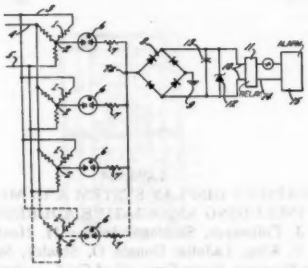
a semiconductor element having a primary current conducting path connected in parallel with the series connection of said illumination source and said resistor, said semiconductor element being in a conductive state when the peak current in the secondary winding is above a preselected threshold and being in a nonconductive state when the peak current in the secondary winding is below said preselected threshold, said semiconductor element in its conductive state placing said illumination source in its first condition and, in its non-conductive state, placing said illumination source in its second condition.

4,496,940

SENSING AND INDICATOR SYSTEM FOR DETECTING HEATING ELEMENT FAILURES

Conrad Christel, Jr., Dryden, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,686
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—640 **9 Claims**



1. A sensing device for detecting failure induced imbalance in one of a plurality of normally balanced circuits of load resistance elements connected to center nodes in three phase balanced Y circuits comprising, in combination:

a plurality of sensing circuits connected to a common node; each sensing circuit being connected to the corresponding center node of one of said balanced Y circuits for sensing the voltage rise at said corresponding center node due to failure induced imbalance, each sensing circuit including a device for allowing a current flow through the sensing circuit responsive to a voltage rise at the corresponding center node only when a predetermined breakdown voltage is reached, each said device further serving as a means for isolating the corresponding center node from the center nodes of the other of said plurality of balanced Y circuits and preventing averaging of the voltage rise when an imbalance occurs at a center node, each said sensing circuit also including current limiting means; and

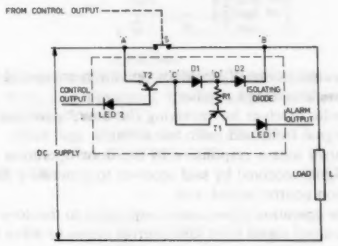
voltage limiting means including a circuit connected to said common node for limiting the voltage at said common node to below said predetermined breakdown voltage upon a failure induced imbalance and current flow through one of said sensing circuits.

4,496,941

SWITCH PROTECTION DEVICE

Stuart C. Clatworthy, Bedfordshire, England, assignor to Restbury Limited, Bedfordshire, England

Filed Jan. 7, 1982, Ser. No. 337,719
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—644 **7 Claims**



1. A supply circuit for supplying current to a load, comprising a load current cut-off switch which is connected in series with the load and which is responsive to a control output to switch from a normally conducting condition in which it conducts load current to the load to a non-conducting condition in which it cuts off load current to the load and a load current protection circuit having a load current path in parallel with the cut-off switch for maintaining a supply of load current to the load in the event that the cut-off switch fails in its non-conducting condition, the protection circuit comprising auxiliary switch means operative simultaneously with the cut-off switch in response to the control output to switch from a conducting condition permitting load current to flow in the load current path of the protection circuit to a non-conducting condition in which it cuts off load current through the load current path of the protection circuit, a switching diode so connected in the load current path of the protection circuit and so biased that with the auxiliary switch means in its conducting condition the switching diode cuts off load current through the load current path of the protection circuit when the cut-off switch is conducting load current and conducts load current through the load current path of the protection circuit when the cut-off switch fails to conduct load current, and an alarm circuit responsive to conduction of load current through the load current path of the protection circuit to generate an alarm signal indicating switch failure.

4,496,942

METHOD AND APPARATUS FOR DOOR OPERATION REMOTE CONTROL

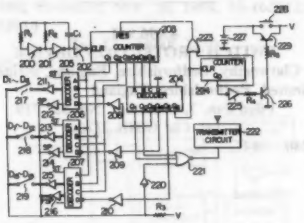
Shigeru Matsuoka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,106
Claims priority, application Japan, Mar. 10, 1981, 56-33078
Int. Cl.³ H04B *7/00;* **E05F** *15/10;* **G05D** *3/08*
U.S. Cl. 340—696 **12 Claims**

1. Apparatus for door operation remote control comprising:

a radio transmitter for transmitting a door operation com-

mand signal, said radio transmitter including operation switch means for generating a door operation command, transmitter means responsive to the operation of said operation switch means for transmitting said door operation command signal repeatedly as a succession of signals and transmission of the door operation command signal transmission stopping means for stopping a given transmitting operation of said transmitter means at the termination of a predetermined period of time from operation of said operation switch means so as to limit the number of signal



transmissions of said door operation command signal to a predetermined number;

a radio receiver for receiving the door operation command signal from said radio transmitter;

control means responsive to the door operation command signal received by said receiver to generate a door operation control signal; and

door operation drive means responsive to the door operation control signal from said control means to drive the operation of a door.

4,496,943

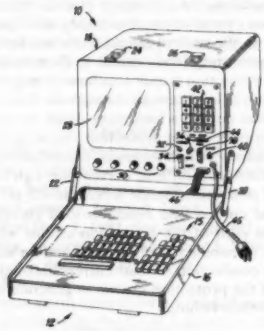
PORTABLE INFORMATION DISPLAY

Richard W. Greenblatt, Passaic Park, N.J., assignor to Portable Terminal Corp., Passaic Park, N.J.

Filed Nov. 18, 1982, Ser. No. 442,544

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—711 **4 Claims**



1. A self contained, lightweight, portable information display unit, without software and disc drive means, for providing communication only with a remote computer, employing known bisynchronous or synchronous, SNA, SDLC data communication protocol, over a voice grade telephone line, consisting only of;

a housing having two compartments connected by hinge means for pivoting said compartments to relative open and closed positions and including hand carrying means secured to a top portion of one of said compartments and being of a size and configuration for single-handed portability via said hand carrying means;

data communication converter means arranged within one of said housing compartments for converting signals only into a data protocol of the remote computer;

cathode ray tube display means arranged within said one of said housing compartments with the screen thereof arranged for displaying information when said compartments are in the open position and being electrically connected to said converter;

a manual keyboard arranged within the other of said housing compartments and electrically connected to said converter for providing input signals thereto, said keyboard facing said cathode ray tube display means when said compartments are in the closed position and positioned for use by an operator when said compartments are in the open position;

a modem arranged within said one of said housing compartments for modulating/demoduating signals fed to and from the remote computer;

a modular phone line connector mounted on said one of said housing compartments and connecting said modem and providing an external connection between said modem and telephone lines for sending signals to and receiving signals from the remote computer;

power supply means arranged within said one of said housing compartments and electrically connected to said display means and said converter and with an external source of power for providing predetermined levels of power to said display means and to said converter means;

said manual keyboard comprising a manual typewriter portion and a standard numerical keypad portion; and

a ventilating fan is arranged in said housing and connected to said power supply for providing air circulation within the interior of said housing.

4,496,944

GRAPHICS DISPLAY SYSTEM AND METHOD INCLUDING ASSOCIATIVE ADDRESSING

Arthur J. Collmeyer, Saratoga; Jeffrey H. Hoel, Sunnyvale; Paul F. King, LaJolla; Donald O. Stanley, San Jose, and Roger Sturgeon, Santa Cruz, all of Calif., assignors to Calma Company, Sunnyvale, Calif.

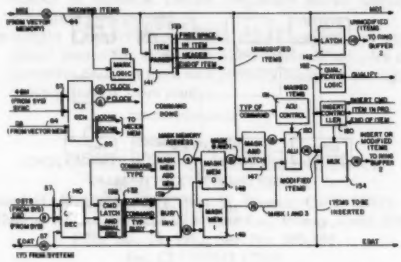
Division of Ser. No. 125,843, Feb. 29, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,637

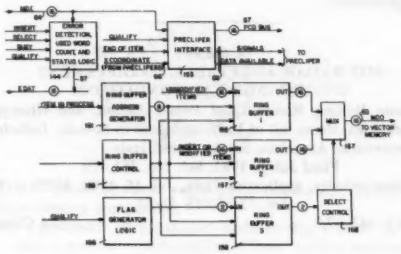
Int. Cl.³ G09G *1/00*

U.S. Cl. 340—723 **19 Claims**

1. In a graphics display system having vector memory means for storing vector data representing one or more graphics images to be displayed, a memory update circuit comprising means for inserting said vector data into said vector memory means wherein said vector data represents one or more polygons and the representation of each polygon includes header information specifying the format of said representation and the properties of said polygons, means for modifying said

vector data within said vector memory means, means for retrieving said vector data from said vector memory means, and





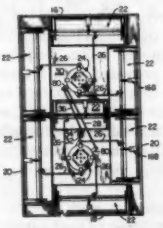
control means for associatively addressing specified ones of said polygons according to a specified set of said properties.

4,496,945

METHOD AND APPARATUS FOR SYMBOL DISPLAY DEVICE

Robert C. Stadjuhar, and Cecil S. Renfro, both of Colorado Springs, Colo., assignors to Skyline Products, Inc., Colorado Springs, Colo.

Filed Jun. 3, 1982, Ser. No. 384,196
Int. Cl.[3] G09G *3/16*
U.S. Cl. 340—764 **30 Claims**



12. A multiple shutter display unit adapted to display a symbol in segment format wherein different ones of said segments define different symbols, comprising;

a housing structure including a front panel having a plurality of openings defining an array of symbol segments, a rear wall and surrounding sidewall;

a support structure mounted in said housing structure;

a plurality of shutter assemblies mounted in said housing adjacent each opening, there being one shutter assembly for each said opening, each said shutter assembly having a first movable shutter panel adapted to selectively mask and unmask said opening whereby said opening is in a display mode when unmasked and in a no display mode when masked and a control rod for moving said first panel between the display and no display modes;

drive apparatus mounted on said support structure and including a rotatable drive disc reciprocally movable between first and second rotational positions;

a plurality of movable drive members each connected to a respective control rod and movably mounted in said housing;

selectively actuable engagement means mounted on said drive disc and movable in common rotation therewith for engaging selected ones of said drive members during reciprocal movement of said drive disc whereby selected ones of said first shutter panels are moved into and out of the display and no display modes; and

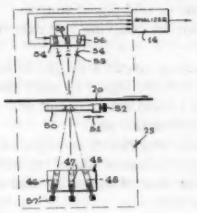
drive means connected to said drive disc for reciprocally rotating said drive disc upon command.

4,496,946

PROGRAMMABLE ELECTRONIC DISPLAY

Eugene R. Pera, San Francisco, Calif., assignor to Peratron Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 424,870
Int. Cl.[3] G09G *3/22*
U.S. Cl. 340—796 **4 Claims**



1. An electronic display system, comprising:

a color display panel with relatively large horizontal and vertical dimensions forming a large display area, said panel including a plurality of discrete sections of color illuminating means arranged in rows and columns, each said section including illuminating means for a plurality of colors;

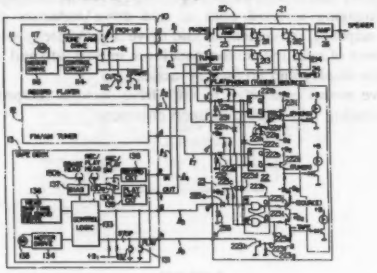
an image signal source comprising means for feeding a film strip carrying a series of color images to be displayed on said display panel, a plurality of light source means for illuminating said film strip in a corresponding plurality of different colors, each of said differently colored light sources being directed through a common aperture onto said film strip, a plurality of photosensing means each responsive to a color generated by a corresponding light source, each of said photosensing means comprising a line of photosensors equal in number to the number of sections in one column on said display panel, each photosensor in a line being responsive to the same color, said plurality of photosensing means generating input signals representing the light from said light sources as modified by a portion of one of said film strip color images exposed to said light;

means for scanning said input signals, and control means for applying the input signals to selected ones of said illuminating means sections, whereby said film strip images are duplicated on said display panel.

4,496,947
FUNCTION SWITCHING SYSTEM FOR AN AUDIO/VIDEO APPARATUS

Fujio Nakashima, Aichi; Takashi Enoki, and Kazuto Nakashima, both of Toyokawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,045
Claims priority, application Japan, Apr. 20, 1981, 56-58535
Int. Cl.[3] H04Q *3/00*
U.S. Cl. 340—825.24 7 Claims



1. A function switching system comprising:

(a) control means including a selection circuit for selecting a signal from a plurality of signal sources and a control circuit therefore connected to said selection circuit;

(b) an external unit separately arranged from said control means for supplying a signal to said control means to serve as at least one of said signal sources;

(c) circuit means for coupling said external unit to said control means;

(d) a first switching circuit arranged in said external unit for supplying a control signal to start the operation of said external unit to said external unit and said control circuit of said control means; and

(e) a second switching circuit arranged in said control means for supplying a control signal to activate said control circuit of said control means to said control circuit and said external unit;

whereby said external unit starts the operation by the control signal of either one of said first switching circuit or said second switching circuit and said selection circuit selects the signal from the signal source of said external unit.

4,496,948
SYSTEM FOR INITIATING THE OPERATION OF AN ELECTRONICALLY-OPERATED DEVICE

Ken Ishizuka, 685 Laval Blvd. - Apt. 105, Laval, Canada (H7M 5C7)

Filed May 26, 1982, Ser. No. 382,125
Int. Cl.[3] E05B *49/00*; H04Q *3/00*
U.S. Cl. 340—825.31 7 Claims

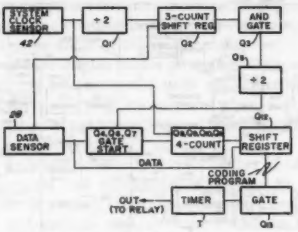
1. A system for initiating the operation of an electronically-operated device, comprising:

(a) a key unit having a code pattern mounted on a circle around the center thereof;

(b) a first rotating sensor eccentrically mounted with respect to to the center of the key unit and adapted to scan the code pattern on the key unit and generate a first output signal which is representative of the code appearing on the key unit;

(c) a second sensor adapted to detect the rotational speed of the first rotating sensor and to generate a second output signal which is representative of the rotational speed of the first rotating sensor;

(d) a signal-processing circuit responsive to said first and second output signals for generating a control signal which is independent of the rotational speed of the rotating sensor; and

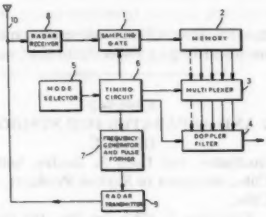


(e) an electrically-operated device responsive to said control signal to perform a given function when a valid code is generated.

4,496,949
MTI RADAR ADAPTABLE TO DIFFERENT ENVIRONMENTAL CONDITIONS

Giuliano Bettini, Rome; Luigi Penso, Latina, and Giuseppe Rodriguez, Rome, all of Italy, assignors to Selenia, Industrie Elettroniche Associate, S.p.A., Rome, Italy

Filed Jul. 8, 1981, Ser. No. 281,479
Claims priority, application Italy, Jul. 16, 1980, 49251 A/80
Int. Cl.[3] G01S *13/52*
U.S. Cl. 343—7.7 4 Claims



1. In a radar having antenna means for the emission of outgoing pulses of different carrier frequencies on a radar beam of predetermined effective width and for the reception of echoes thereof reflected by outlying targets during a range sweep initiated by any outgoing pulse, frequency-generating and pulse-forming means provided with a timer operable to randomly select any one of a predetermined number of available carrier frequencies for emission at any sweep, transmitting means inserted between said pulse-forming means and said antenna means, receiving means connected to said antenna means, and gating means controlled by the timer for sampling incoming echoes,

the combination therewith of:

memory means connected to said gating means for storing samples of echoes incoming during each sweep for n consecutive sweeps at locations whose relationship with the carrier frequencies of the respective echoes is memorized by said timer, the number j of available carrier frequencies being less than the number n of outgoing pulses accommodated within the width of the radar beam whereby at least some carrier frequencies randomly recur during any scan of a target, with no carrier frequency occurring more than $m<n$ times during n successive sweeps, said frequency-generating means maintaining phase coherence of each carrier frequency for at least said n sweeps;

multiplexer means connected to said memory means and

controlled by said timer for concurrently reading out, in the course of each sweep, up to m correlated samples of echoes of identical carrier frequency stored during n preceding sweeps; and

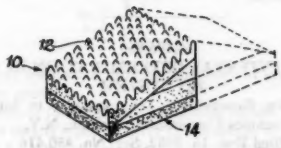
m-weight Doppler-filter means connected to said multiplexer means for evaluating the correlated samples concurrently read out from said memory means to distinguish moving targets from clutter.

4,496,950

ENHANCED WIDE ANGLE PERFORMANCE MICROWAVE ABSORBER

Leland H. Hemming, P.O. Box W, Santee, Calif. 92071, and Gabriel A. Sanchez, 12636 Metate Ln., Poway, Calif. 92064

Filed Jul. 16, 1982, Ser. No. 399,155
Int. Cl.³ H01Q *17/00*
U.S. Cl. 343—18 A **7 Claims**



1. An enhanced wide angle performance microwave absorber element comprising:

(a) a generally wedge-shaped body having a back surface, and a generally plane-defining front surface striking an acute angle with said back surface to define a thick end and a thin end of said generally wedge-shaped body;

(b) said front surface defining a plurality of impedance matching projections projecting forwardly generally orthogonally from the plane defined by said front surface; and

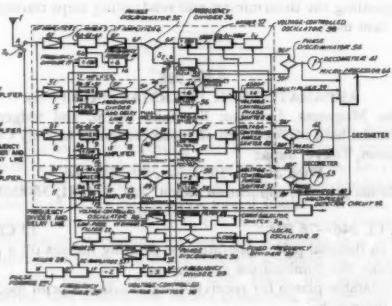
(c) said body being of greater microwave impedance adjacent said back surface than at said front surface.

4,496,951

HYPERBOLIC NAVIGATION RECEIVER

Kazuo Tsukada, Kakogawa; Yoshiharu Kanzaki, Sagamihara, and Yoshikazu Hori, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 31, 1981, Ser. No. 336,327
Claims priority, application Japan, Jan. 17, 1981, 56-5667
Int. Cl.³ G01S *1/30*
U.S. Cl. 343—394 **5 Claims**



1. A hyperbolic navigation receiver, comprising

master receiving means corresponding to a master station and a plurality of slave receiving means corresponding to a plurality of slave stations, each of said master and slave receiving means having

receiving means for receiving and distinguishing incoming signals from said master and slave stations, and

a tracking loop filter having an output and including

first generating means for generating a multifrequency signal corresponding to a frequency of said receiving means, said first generating means having an input and an output and providing at said output an output signal which is the output signal of said tracking loop filter, the first gnerating means of said master receiving means comprising a first voltage-controlled oscillator and the first generating means of each of said slave receiving means comprising a first voltage-controlled phase shifter electrically connected to the output of said tracking loop filter of said master receiving means,

first dividing means electrically connected to said first generating means for dividing an output signal of said first generating means to the frequency of an incoming signal from said receiving means, said first dividing means producing an output signal, and

first phase discriminating means electrically connected to said first dividing means for phase discriminating the output signal of said first dividing means from said incoming signal of said receiving means, said first phase discriminating means having an output connected to the input of said of said first generating means and producing at said output an output signal according to which said multifrequency signal is controlled,

second phase discriminating means electrically connected to said first generating means of said tracking loop filter for phase discriminating the output signal of said tracking loop filter of said master receiving means from each of the output signals of said tracking loop filters of said slave receiving means, said second phase discriminating means having an output and producing at said output an output signal for microprocessing, and

second generating means for generating a local multifrequency signal, said second generating means being self-oscillating and each of said receiving means of said slave receiving means further including second dividing means electrically connected to said second generating means for dividing said local multifrequency signal in accordance with the incoming frequency of a received signal from said master and slave stations, said second dividing means producing an output signal, and

first mixing means electrically connected to said second generating means and said second dividing means for mixing said received signal with the output signal of said second dividing means for converting to an intermediate frequency signal.

4,496,952

TRAP VERTICAL ANTENNA WITH PARALLEL L-C CIRCUITS FOR BROADBANDING

Donald R. Newcomb, Box 356E, Rte. 2, San Marcos, Tex. 78666

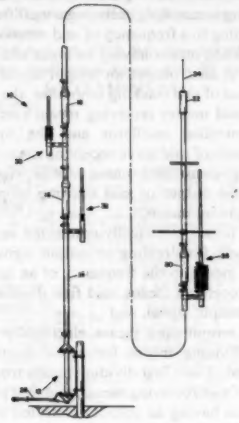
Filed Sep. 20, 1982, Ser. No. 420,481
Int. Cl.³ H01Q *9/00, 5/00*
U.S. Cl. 343—722 **6 Claims**

1. Antenna comprising:

a. vertical antenna for 80, 40, 20, 15 and 10 meters including an electrically conducting member and including traps in series for 20, 15, and 10 meters; and,

b. inductor-capacitor tube-coil means positioned below each of said traps, each of said inductor-capacitor tube-coil means including first outer cylindrical tube, an inner tubular insulator telescoped therein, and a second inner cylindrical tube telescoped therein, and a coil connected between said outer and inner cylindrical tubes about said tubular insulator, means for adjusting L-C ratio, and clamp means for clamping between a lower portion of

each of said traps and a lower portion of each of said outer cylindrical tubular member whereby said tubular induc-



tor-capacitor tube-coil means provides for addition of frequencies to said vertical antenna.

4,496,953

BROADBAND VERTICAL DIPOLE ANTENNA

Raleigh J. Spinks, Jr., Marion; Richard C. Edwards, and Joseph J. Dahm, both of Cedar Rapids, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1982, Ser. No. 401,474
Int. Cl.³ H01Q *9/16*
U.S. Cl. 343—792 **5 Claims**

1. An antenna system for providing mounting independent operation comprising:

an antenna section including a first electrical conductor extending along an axis and forming a radiating element for radiating radio frequency energy over a selected band of frequencies, and a second electrical conductor forming a radiating element and constructed as an electrically conductive tubular member defining a counterpoise ground plane for said first electrical conductor, said second electrical conductor being coaxial to said axis and said first and second electrical conductors each having one end coupled to one another such that said first and second electrical conductors are supported in a collinear configuration;

a transmission line having first and second ends and a characteristic impedance of substantially 50 ohms;

an antenna coupler forming an impedance matching network electrically coupled to said first end of said transmission line and to said one end of said first and second electrical conductors to impedance match said antenna section at a nominal 50 ohms;

a plurality of ferrite cores disposed within said conductive tubular member and surrounding said transmission line, said ferrite cores being spaced from one another along the length of said transmission line within said conductive tubular member;

a mounting base; and

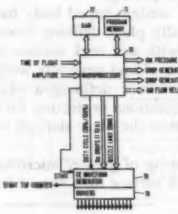
means for coupling said conductive tubular means to said mounting base to support said antenna section with respect to said mounting base, said transmission line extending through said means for coupling such that said second end of said transmission line extends to said mounting base, said means for coupling further including a choke coupled between said mounting base and said antenna section to choke electromagnetic energy induced in said transmission line from said mounting structure and antenna section.

4,496,954

RESERVO INTERVAL DETERMINATION IN AN INK JET SYSTEM

John W. Irwin, Georgetown, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,416
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **3 Claims**



1. A method for improving the efficiency of operation of an ink jet printing system comprising the steps of:

adjusting initially the operating parameters of the system prior to operation;

determining, while the system is operating, the optimal time period between system parameter readjustments;

readjusting the operating parameters of the system in accordance with the determined time period; and

repeating the determining and readjusting steps during system use.

4,496,955

APPARATUS FOR THERMAL PRINTING

Sadao Maeyama, Urayasu; Kiyotaka Dochi, and Shigemichi Honda, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

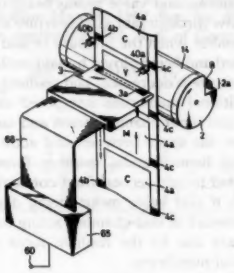
Filed Jun. 2, 1982, Ser. No. 384,284
Claims priority, application Japan, Jun. 5, 1981, 56-85686
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **13 Claims**

1. In thermal print apparatus for printing images on a print medium, the combination comprising:

a rotatable platen for receiving and rotating a print medium therewith;

thermal print means adjacent said platen and selectively energizable to cause images to be printed on said print medium, said thermal print means having a dimension sufficient to cause a strip of images to be printed in substantially a single energizing operation;

a movable web of thermally transferable material having a run interposed between said platen and said thermal print means, said web having first index marks thereon indicating the boundaries between adjacent frames, and second index marks thereon indicating the beginning of a sequence of frames of respectively different colors of thermally transferable material arranged in repeated sequence;



transport means for moving said web in accord with said index marks;

input means for supplying energizing signals to said thermal print means representative of the image to be printed; and

means for rotating said platen at a predetermined rate.

4,496,956

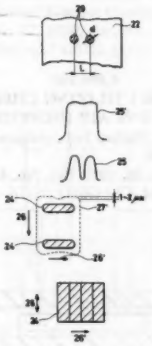
APERTURE MASK FOR IMAGE SCANNING AND RECORDING SYSTEM

Ikuo Mitsuka, Osaka, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 19, 1982, Ser. No. 399,526

Int. Cl.³ G01D *9/42*

U.S. Cl. 346—108 **7 Claims**



1. In an image scanning and recording system having a recording section comprising laser source means for providing a laser beam, modulating means for modulating the laser beam in a manner corresponding to an image signal produced by scanning of an original in an original scanning section, collimating means for collimating the modulated laser beam on a photographic recording medium for scanning, in a primary scanning direction and in a secondary scanning direction, said recording medium with the laser beam, the improvement wherein said collimating means comprises: an aperture mask positioned between said modulating means and a focusing means; said aperture mask having a pair of apertures in alignment with the optical path of the laser beam; and said apertures being of identical size and shape and disposed in parallel to said secondary scanning direction of said recording medium, at a predetermined distance between the centers of the apertures, and the apertures being of such size and shape to thereby produce sharply defined edges in the imaged pattern of the laser beam on the recording medium in the secondary scanning direction when scanning is conducted, with the edge uneveness in the image produced being about 1–2 μm as compared to edge uneveness of about 20 μm produced in the absence of said aperture mask.

4,496,957

OPTICAL DISK

Thomas W. Smith, Penfield, N.Y.; David Cheng, Palo Alto, Calif., and Anthony T. Ward, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1979, Ser. No. 54,204

Int. Cl.³ G01D *15/34*

U.S. Cl. 346—135.1 **5 Claims**

1. An optical recording member for optically recording and retrieving of information thereon comprising:

a substrate having coated thereon a thin layer of a colloidal dispersion of minute particles of a metal or its oxide in a polymer binder, said metal being a transition metal element of the Periodic Chart except those of Group IIIB of said Chart, said minute particles being about 20 to 150 angstroms in size, said thin layer being ablatable to form micron sized information containing marks thereon,

a protective layer on said thin layer, said protective layer being substantially transparent to writing and reading optical radiation for said optical recording member.

4,496,958

DRAWING PEN EXCHANGER FOR COMPUTER CONTROLLED DRAWING MACHINES

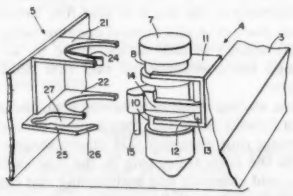
Joachim Brandt, Hamburg; Gerhard Deblitz, Quickborn; Jürgen Post, Stelle; Bernd Willimczik, Wedel; Rolf Marten, Hamburg; Rolf Paschen, Elmshorn, and Gerold Anderka, Ellerbek, all of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Nov. 16, 1982, Ser. No. 442,064

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145904

Int. Cl.³ G01D *15/00*

U.S. Cl. 346—139 R **6 Claims**



1. In a drawing pen exchanging device of the type wherein a first holding element is adapted vertically to hold a drawing pen in a first receptacle which is part of a movable drawing head and a second pressure element is adapted vertically to hold a drawing pen in a second receptacle which comprises a

guide and is part of a stationary pen holder on a drawing pen magazine, the improvement wherein the first holding element (14) yieldably urges a pen located in said first receptacle (7) against a stationary receiving zone (11, 12) and further comprises a pin (15) which extends vertically and below said stationary receiving zone and is operable to engage with a horizontally disposed surface of said guide (25) as the drawing head is moved along a linear movement path, substantially perpendicular to the longitudinal axis of a drawing pen held in either receptacle and proximate to the magazine.

4,496,959

COUPLING FOR THE LEAKAGE-FREE CONNECTION OF FLUID-FILLED PIPES AND CONTAINERS

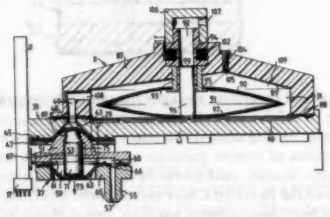
Klaus-Dieter Frerichs, Schortens, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

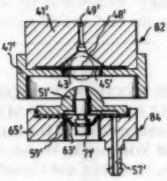
Filed Sep. 14, 1982, Ser. No. 417,897

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3137969

Int. Cl.³ G01D *15/18;* **F16L** *37/28*

U.S. Cl. 346—140 R **6 Claims**





1. A fluid coupler for making a leakage-free connection between first and second fluid-containing members, the assembled coupler having a longitudinal axis, comprising:

a first half-coupler, including

a plate having first and second surfaces normal to said longitudinal axis, said first surface having an axial conical opening therein with the wider portion of said conical opening in the plane of said first surface, the narrower portion of said conical opening being connected to the second surface of said plate by an axial fluid passage for connection to said first fluid-containing member;

an elastic sealing membrane having a slit therein, said slit being located along said longitudinal axis; and

a clamping ring clamping said elastic sealing membrane across the conical opening in the first surface of said plate, said clamping ring maintaining said elastic sealing membrane substantially parallel to the first surface of said plate with said slit in the closed position; and

a second half-coupler for mating with said first half-coupler, including

a hemispherical member having a hemispherical surface with an axial aperture therein;

valve means positioned within the axial aperture of said hemispherical member, said hemispherical surface being pressed against said elastic sealing membrane when said first and second half-couplers are engaged thereby opening the slit in said elastic sealing membrane and expelling any air present in the coupling region;

an input channel means for connecting said second half-coupler to said second fluid-containing member; and

resilient means coupling said input channel means to said valve means, said valve means being opened to permit fluid flow through said axial aperture in said hemispherical member when the pressure in said input channel is increased and being closed by said resilient means when said pressure is decreased, said resilient means including an additional membrane interposed under tension between said input channel means and said hemispherical member, the space between said additional membrane and said hemispherical member forming a chamber connected to said second fluid containing member, the position if said valve means being determined by the fluid pressure in said chamber acting on said additional membrane and by the resilient force exerted by said additional membrane,

wherein said valve means includes a conical pin affixed to said additional membrane, and the axial aperture in said hemispherical member has a conical bore tapered toward the opening in said hemispherical surface, said conical pin being pressed toward said opening by said additional membrane.

4,496,960

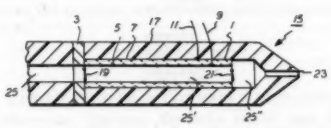
INK JET EJECTOR UTILIZING CHECK VALVES TO PREVENT AIR INGESTION

Kenneth H. Fischbeck, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 420,449

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **2 Claims**



1. A pressure pulse drop ejector which comprises:

(a) an ejector body,

(b) an ink channel having an exit orifice in said ejector body,

(c) a tubular electromechanical transducer surrounding a portion of said channel and mounted for slidable movement within said ejector body,

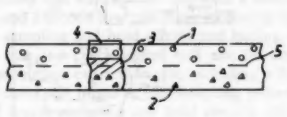
(d) a check valve provided at each end of said electromechanical transducer, and

(e) means for holding the end of said electromechanical transducer furthest from said orifice stationary in respect to said orifice.

4,496,961
CHECK PAPER THAT IS PROTECTED AGAINST FORGERY AND TAMPERING

Ludwig Devrient, Vaterstetten, Fed. Rep. of Germany, assignor to GAO Gesellschaft Für Automation Und Organisation mbH., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 217,422, Dec. 17, 1980, abandoned. This application May 10, 1982, Ser. No. 376,681
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951486
Int. Cl.³ B41M 5/16
U.S. Cl. 346—206 14 Claims

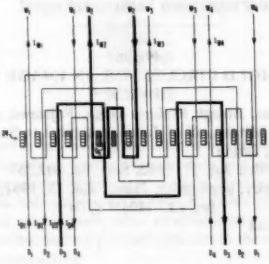


1. Check paper which is resistant to forgery or tampering and which includes:
(a) crushable micro capsules containing a leuco ink;
(b) a color acceptor for reacting with the leuco ink to cause a color formation or color change;
(c) paper formed during manufacture out of at least two webs;
(d) said crushable micro capsules and said color acceptor being present together only in a region of the interface of the webs.

4,496,962
HIGH RESOLUTION MAGNETIC PRINTING HEAD

Joseph A. Lahut, and John A. Popelish, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Dec. 22, 1980, Ser. No. 218,890
Int. Cl.³ G01D 15/12
U.S. Cl. 346—74.5 7 Claims

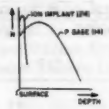


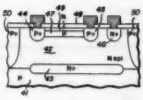
1. A magnetic printing head of the type having a comb-type magnetic recording head assembly extending transversely of the direction of a moving magnetic medium upon which magnetic printing is to be produced by the head, the improvement comprising:
an odd plurality of magnetic combs stacked in the direction of the moving medium and offset relative to each other in the direction transverse to the direction of the moving tape;
and
magnetic field-generating means for creating magnetic fields in opposite transverse directions both in adjacent gaps of individual combs and also in like-ordered gaps of adjacent combs.

4,496,963
SEMICONDUCTOR DEVICE WITH AN ION IMPLANTED STABILIZATION LAYER

James L. Dunkley, Santa Clara, and Robert C. Dobkin, Atherton, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 716,049, Aug. 20, 1976, abandoned, which is a continuation of Ser. No. 575,418, May 7, 1975, abandoned, which is a continuation of Ser. No. 377,611, Jul. 9, 1973, abandoned. This application Mar. 9, 1979, Ser. No. 19,135
Int. Cl.³ H01L 29/80
U.S. Cl. 357—22 6 Claims





1. A planar junction field effect transistor comprising:
a substrate of a first type conductivity,
a first layer of a second type conductivity on said substrate forming a gate region,
a source region of said first type conductivity in said layer at the surface thereof,
a drain region of said first type conductivity in said layer at the surface thereof and separated from said source region,
an ion implanted channel region of said first type conductivity in said layer extending between said source and drain regions,
an insulating layer on the surface of said first layer and overlying said channel region,
an ion implanted stabilization layer of said second type conductivity disposed on top of said channel region at the surface of said first layer and located between said channel region and said insulation layer, said stabilization layer extending between said source region and said drain region and having a dopant concentration higher than the dopant concentration in said channel region and acting to stabilize the channel region and reduce noise in the transistor, and
contact means at the surface of said first layer making electrical contact with said source region, said drain region, and said gate region.

4,496,964
MOSFET LIGHT DETECTING DEVICE HAVING A SCHOTTKY JUNCTION

Natsuro Tsubouchi, and Masahiko Denda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

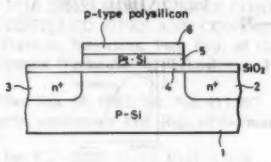
Filed Aug. 18, 1981, Ser. No. 293,794
Claims priority, application Japan, Aug. 19, 1980, 55/114490
Int. Cl.³ H01L 27/14, 29/48, 29/04, 23/48
U.S. Cl. 357—30 5 Claims

1. A device for detecting incident light, comprising:
a semiconductor substrate of a first conductivity type having a surface region, and having a source region and a drain

region formed therein of a second conductivity type, a light detection current flowing between said source and drain regions in response to incident light absorbed by said device;

an oxidation resistant layer formed on said surface region;

a metallic layer formed on said oxidation resistant layer between said source region and said drain region for absorbing said incident light; and



a polysilicon layer gate electrode formed on said metallic layer and forming a Schottky barrier at the interface between said polysilicon layer and said metallic layer, said absorption of said incident light by said metallic layer causing conduction across said Schottky barrier to control said light detection current.

4,496,965

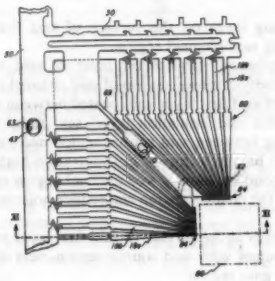
STACKED INTERDIGITATED LEAD FRAME ASSEMBLY

John W. Orcutt, Garland; Angus W. Hightower, Richardson, and Reginald W. Smith, Arlington, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 264,923, May 18, 1981,. This application Jan. 9, 1984, Ser. No. 568,942

Int. Cl.³ H01L *23/48, 23/02, 39/02*

U.S. Cl. 357—70 **2 Claims**



1. A lead frame assembly for an integrated circuit device comprising:

a first lead frame having opposed side rails and a first group of leads extending inward from each side rail; and

a second lead frame disposed atop and in contact with the first lead frame, the second lead frame having opposed side rails and a second group of leads extending inward therefrom, wherein each lead in the second group of leads includes a joggled section near its associated side rail and wherein the second group of leads is staggered in relationship to the first group of leads so that the leads of the second group lie between and substantially coplanar with adjacent leads of the first group.

4,496,966

METHOD FOR MIXING TWO COLOR TELEVISION SIGNALS

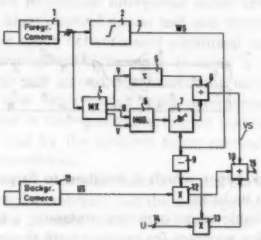
Michael Hausdörfer, Mühltal, and Heinz Hess, Welterstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,888

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143653

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—22 **8 Claims**



1. Method for mixing two colour television signals comprising a foreground signal sensed by a foreground camera and a background signal, comprising

deriving a switching signal (WS) as a function of the colour of the foreground signal by providing a first switching signal when the colour of the foreground sensed by the foreground camera differs from a selected background colour and a second signal when the colour sensed by the foreground camera is effectively only that of said selected background colour;

desaturating selected portions of the foreground signal while maintaining the luminance component thereof substantially unaltered during occurrence of said second switching signal;

at least partially suppressing portions of the background signal during occurrence of the first switching signal;

and adding the selectively desaturated foreground signal and the partially suppressed background signal.

4,496,967

SAMPLE HOLD CIRCUIT FOR AN IMAGE PICK-UP DEVICE

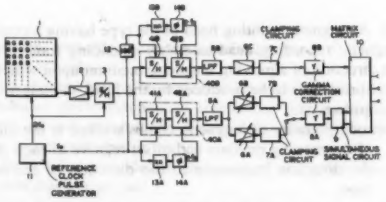
Masatoshi Sase, Atsugi; Makoto Onga, Fujisawa, and Seisuke Yamanaka, Mitaka, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 27, 1982, Ser. No. 402,357

Claims priority, application Japan, Jul. 28, 1981, 56-117130

Int. Cl.³ H04N *9/04*

U.S. Cl. 358—44 **4 Claims**



1. A signal processing apparatus which is used for processing a color signal component in a dot sequential color signal coded by a color filter constructed in an image pick-up means comprising, a first sampling and hold circuit operated by a sam-

pling pulses having a predetermined frequency f_0, a second sampling and hold circuit receiving the output of said first sampling and hold circuit and operated by a sampling pulse at a frequency which is selected to be N times the predetermined frequency (Nf_0) for sampling and holding an output signal of the first sampling and hold circuit, and a first low pass filter receiving the output of said second sampling and hold circuit and having a cut-off frequency for eliminating the sampling noise of said second sampling and hold circuit sufficiently so that said color signal is not attenuated, further comprising a third sampling and hold circuit receiving another color signal and operated by sampling pulses with a sampling frequency of f_0, a fourth sampling and hold circuit receiving the output of said third sampling and hold circuit and with a sampling frequency of Nf_0 and a second low pass filter receiving the output of said fourth sampling and hold circuit and having a cut-off frequency so that the color signal will not be attenuated, wherein N is an integer other than one, including a first phase shifter which shifts the phase of the sampling pulses used in said third and fourth sampling and hold circuits 180 degrees from the phases of the sampling pulses used in said first and second sampling and hold circuits, including a second phase shifter for shifting the sampling pulses supplied to said second sampling and hold circuit to eliminate sampling of noise components, and including a third phase shifter for shifting the sampling pulses supplied to said fourth sampling and hold circuit to eliminate sampling of noise component.

4,496,968
REPRODUCTION OF COLORED IMAGES

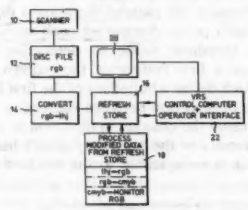
Peter C. Pugsley, Pinner, England, assignor to Crosfield Electronics Limited, London, England

Filed Jul. 13, 1982, Ser. No. 397,701

Claims priority, application United Kingdom, Jul. 14, 1981, 8121659

Int. Cl.³ G03F *3/08*; H04N *1/46*

U.S. Cl. 358—80 **15 Claims**



1. A method of retouching a coloured image in the preparation of printing plates for the reproduction of a coloured original, including deriving electric signals representing colour values of selected successive picture elements of the original and using the said signals, after modification, to control the colours of corresponding picture elements in the reproduction, the method comprising:

identifying signals corresponding to picture elements in a selected area of the original;

deriving a luminance signal from the colour-representing electric signals corresponding to the selected area;

applying the luminance signal as an input to each of a pair of one-dimensional function generators to generate chromaticity signals as predetermined or adjustable functions of the luminance signal;

and preparing the said printing plates for reproducing the coloured original using, for picture elements within the selected area, signals derived from the generated chromaticity signals and the luminance signal in place of the said colour-representing signals originally derived for those picture elements, while using for the reproduction of picture elements in the remaining area signals whose colour values are based on the colour values of the original colour-representing electric signals.

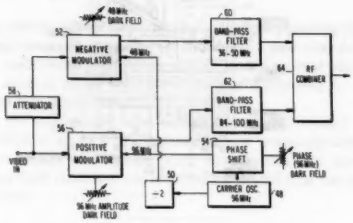
4,496,969
LIGHT VALVE PROJECTION SYSTEM WITH IMPROVED VERTICAL RESOLUTION

Thomas T. True, Camillus, and William E. Good, Liverpool, both of N.Y., assignors to General Electric Company, Portsmouth, Va.

Filed Dec. 22, 1982, Ser. No. 452,188

Int. Cl.³ H04N *9/31*

U.S. Cl. 358—62 **11 Claims**



1. A light valve projection apparatus including electron beam means for scanning a raster of orthogonally related diffraction gratings on a light modulating fluid to diffract incident light into different spectral colors for projection onto a viewing surface, said electron beam means including vertical and horizontal deflection means and modulating means connected to said vertical and horizontal deflection means for controlling the depth of the grooves in said diffraction gratings thereby controlling the diffraction of said incident light into different spatial directions and angular deviations permitting control of the color components, said modulating means comprising:

carrier signal generating means for generating a plurality of carrier signals each having a different frequency, the frequency of each carrier signal being higher than any video signal to be reproduced, to diffract light of a predetermined spectral color,

first modulator means connected to receive at least one of said carrier signals and at least one video signal corresponding to at least one predetermined spectral color for modulating the carrier signal with the video signal and applying the modulated signal to said horizontal deflection means,

second modulator means for receiving a second one of said carrier signals and a second video signal corresponding to a second predetermined spectral color for modulating the carrier signal with the video signal and applying the modulated signal to said vertical deflection means, said second one of said carrier signals including a fundamental signal and a phase controlled harmonic signal and said second modulator means positively modulating said harmonic signal and combining the modulated harmonic signal with said fundamental signal so that the resultant modulated signal applied to said vertical deflection means produces an axis dwell modulation of the charge deposited to form the horizonal grooves of one of said diffraction gratings.

4,496,970

ARRANGEMENT FOR THE AUTOMATIC ADJUSTMENT OF AT LEAST ONE OBJECT

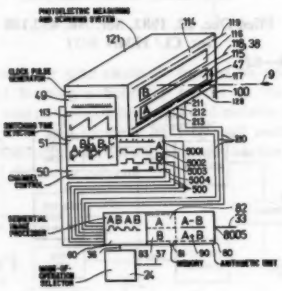
Adelbrecht Schorcht; Dietmar Klingenfeld, both of Jena; Reiner Hesse, Jena-Lobeda; Rainer Dastis, Jena-Lobeda, and Volker Linz, Jena-Lobeda, all of German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Aug. 14, 1981, Ser. No. 293,038

Claims priority, application German Democratic Rep., Nov. 3, 1980, 224904

Int. Cl.³ H04N 7/18

U.S. Cl. 358—101 11 Claims



1. In an arrangement for the automatic adjustment of at least one object, in a photoelectric measuring and scanning system wherein the object is provided with adjustment marks having at least one symmetrical axis, the marks being illuminated by a light source and reproduced by optical systems with a common optical axis on the scanning plane of the photoelectric measuring and scanning system, the video signal of the measuring and scanning system being processed electronically, evaluated by an arithmetic unit and converted into control signals for at least one final control element that provides the adjustment; the improvement wherein a first means is provided for activating first and second image segments separated by a stationary axis in the scanning plane of the photoelectric measuring and scanning system, said image segments having substantially the same formation and being assembled opposite to each other on the stationary and optical axis and parallel to the symmetrical axis of the adjustment marks, a second means being provided in the photoelectric measuring and scanning system for enabling periodic scanning vertially of the stationary axis, and a switching time point detector connected to the photoelectric measuring and scanning system for presetting first, second and third switching time points, between which the two image segments are alternately employed for video signal production, a time base clock generator connected to said second means, said switching time point detector being a component of a channel control arrangement, the measuring and scanning system and also the channel control arrangements being connected at their outputs to a sequential video signal processing arrangement, and an arithmetic unit comprising at least one memory operable in two function groups and at least one arithmetic arrangement having an output providing a control signal for rule deviation to said final control element.

4,496,971

DETECTION APPARATUS

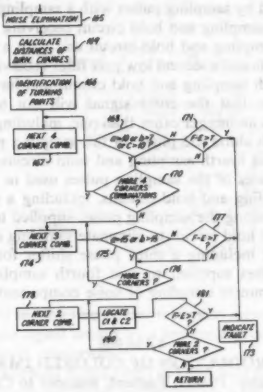
Geoffrey A. W. West, London, and Leonard Norton-Wayne, Glenfield, both of England, assignors to National Research Development Corporation, London, England

Filed Jul. 16, 1982, Ser. No. 398,880

Claims priority, application United Kingdom, Jul. 22, 1981, 8122618

Int. Cl.³ H04N 7/18

U.S. Cl. 358—106 14 Claims



1. A method of detecting anomalies in a reproduction of a pattern on a workpiece comprising the operation of irradiating that surface of the workpiece carrying the pattern, scanning the said surface with detection means sensitive to such radiation to derive a video signal representing an array of points on the said surface, the signal having at least two levels relating to respective features of the pattern, deriving a digital value of the signal for each point, comparing each such value with a predetermined threshold value to determine those points which constitute a first feature of the pattern, determining those points which define a boundary of the first feature, determining changes of direction between successive points on the boundary, and using the changes in direction so determined to identify any anomaly in the boundary which has at least one dimension which is comparable to the smallest dimension of the pattern.

4,496,972

METHOD FOR THE REPRESENTATION OF VIDEO IMAGES OR SCENES, IN PARTICULAR AERIAL IMAGES TRANSMITTED AT REDUCED FRAME RATE

K. Reiner Lippmann, and K. Heinrich W. Dörgeloh, both of Brunswick, Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt e.v., Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 262,214, May 8, 1981,. This application Nov. 1, 1982, Ser. No. 438,537

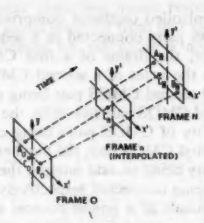
Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3018329; Nov. 3, 1981, 3144050

Int. Cl.³ H04N 7/12, 7/18

U.S. Cl. 358—109 7 Claims

7. An apparatus for the reproduction of video scenes transmitted at reduced frame rates, comprising storage means for alternately storing the transmitted frames, correlation means for detecting the locations of a small number of distinctive corresponding reference points in said stored frames, at least two of said reference points being situated at different locations, means for calculating auxilliary coefficients from the locations of said reference points, means for calculating the vertical and horizontal positions in the stored frames for each

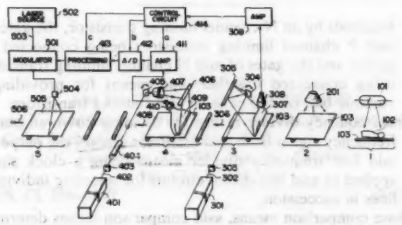
picture element in an intermediate frame to be reconstructed from said reference points, and means for interpolation and/or extrapolation of the intensity of each picture element of said intermediate frame.



4,496,973
RADIATION IMAGE READ-OUT METHOD AND APPARATUS

Kazuo Horikawa, and Satoshi Arakawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 24, 1982, Ser. No. 444,096
Claims priority, application Japan, Nov. 25, 1981, 56-188660
Int. Cl.³ H04N *5/32, 5/30*
U.S. Cl. 358—111 **36 Claims**



1. In a radiation image read-out method in which a stimulable phosphor sheet carrying a radiation image stored therein is exposed to stimulating rays which causes the stimulable phosphor sheet to emit light in the pattern of the stored image, and the emitted light is photoelectrically read out,

the radiation image read-out method comprising: uniformly desensitizing the stimulable phosphor sheet, thereafter conducting preliminary read-out by use of stimulating rays having stimulation energy lower than the stimulation energy of stimulating rays used in final readout, and setting the read-out conditions in said final read-out based on the image input information obtained by said preliminary read-out.

4,496,974
CONVERSION OF THE SCANNING LINE COUNT OF TELEVISION PICTURES

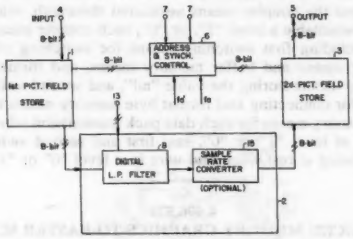
Jürgen Heitmann, Alsbach-Hähnlein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,775
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126635
Int. Cl.³ H04N *5/02*
U.S. Cl. 358—140 **11 Claims**

1. Method of changing the number of lines per television picture for at least a portion of pictures represented by digitalized television signal comprising the steps of:

writing digital television signals of a first picture field of said signals completely into a first picture field store (1) in a first line scan direction;

at the beginning of a second picture field following said first picture field, reading the signals of said first picture field out of said first picture field store in a second line scan direction perpendicular to said first line scan direction;



filtering said signals of said first picture field by passing them through processing means (2) including a low-pass filter;

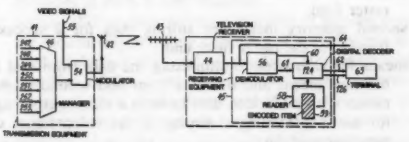
writing said filtered television signals into a second picture field store in a line scan direction corresponding to said second line scan direction (3), and

reading the stored television signals out of said second picture field store in a line scan direction perpendicular to that in which said signals were written into said second picture field store and corresponding to said first line scan direction.

4,496,975
ONE-WAY DATA TRANSMISSION SYSTEMS

Maurice Y. Noirel, Montfort, France, assignor to L'Etat Francais, Represente par Le Ministre des P.T.A. (Centre National D'Etudes des Telecommunications), Paris, France

Filed May 10, 1982, Ser. No. 376,790
Claims priority, application France, May 14, 1981, 81 10089
Int. Cl.³ H04N *1/32;* **H04J** *3/16*
U.S. Cl. 358—147 **2 Claims**



1. A one-way data transmission system wherein a transmitting station transmits packs of digital data, from at least one of several channels, each data pack including a prefix containing synchronism signals and channel identification code signal, a data pack format signal indicating the length of the data sequence following the prefix when the transmitted data are teletext data, the transmitted data have a structure such that they provide possible error corrections and ciphering, the length of the transmitted packs always being a maximum and the format of the byte value being nil, the transmitting station comprising a coupler means associated with each of said channels, each of said coupler means having an input circuit means with an input coupled to receive signals of a channel associated therewith, data memory means coupled to an output of said input circuit means, multiplexing circuit means coupled to an output of said data memory means, control circuit means, common to all of said coupler means, counter means fed at a predetermined rate, means responsive to a full memory for delivering an inhibition control signal to said input circuit

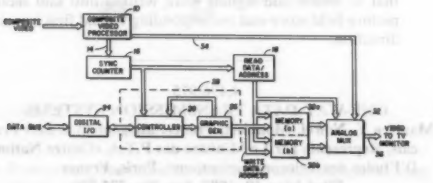
means, means for connecting said data memory means to said multiplexing circuit and then reading out and resetting said counter and thereafter suppressing said inhibition control signal, register means having a settable maximum capacity coupled to said means for delivery said inhibition control signal to deliver said inhibition control signal when the count of said data reaches a predetermined value, small capacity buffer memory means coupled between said data memory means and said input circuit means controlled by a programmed control circuit means for controlling the read out of data from said buffer memory, a wire coupled between each channel equipment and the coupler means associated therewith, said wire being switchable a level "1", or "0", each coupler means further including first switching means for switching off said counter means and buffer memory means, and format byte memory means storing the value "nil", and second switching means for connecting said format byte memory means to said data memory means for each data pack transmission when said wire is at level "1" or "0", said first and second switching means being at rest when said wire is at level "0" or "1".

4,496,976

REDUCED MEMORY GRAPHICS-TO-RASTER SCAN CONVERTER

Ronald L. Swanson, and Lyle R. Strathman, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,013
Int. Cl.³ H04N *7/04, 5/22*
U.S. Cl. 358—147 **9 Claims**



1. A system for superimposing data on an all-raster scanned video display comprising:

means for providing a video signal;

first memory means for storing data for a fraction of one raster field;

second memory means for storing data for a successive fraction of the raster field; and

means for alternately multiplexing the data from said first memory means and the data from said second memory means with said video data to form a video output signal for use in providing a display of the video signal with superimposed data.

4,496,977

SYNCHRONIZING CIRCUIT FOR MATRIX TELEVISION SET

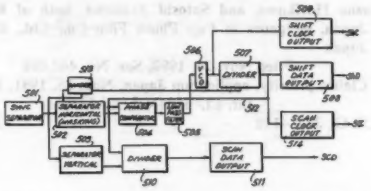
Masayuki Ikeda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Division of Ser. No. 295,192, Aug. 21, 1981, Pat. No. 4,393,405. This application May 24, 1983, Ser. No. 497,489
Claims priority, application Japan, Aug. 22, 1980, 55-116278
Int. Cl.³ H04N *5/04*
U.S. Cl. 358—148 **11 Claims**

1. In a synchronizing circuit for a matrix television set having display means including picture elements arranged in a matrix of lines and columns, and connected to line driver and column driver circuits respectively so as to be individually selectable in both line and column directions, and wherein display is made by selecting lines and columns successively, the improvement therein comprising:

a voltage controlled oscillator circuit, said oscillator circuit producing a shift clock signal applied to said column driver circuits for selecting individual columns in succession;

said voltage controlled oscillator comprising a plurality of similar CMOS pairs connected in a sequence to form a ring oscillator, the drains of a first CMOS pair being connected to the gates of a second CMOS pair and the drains of said second CMOS pair being connected to the gates of a third CMOS pair and so on, the drains of the last of said plurality of CMOS pairs being connected to the gates of said first CMOS pair, the number of CMOS pairs in said plurality being an odd integer, the sources of each CMOS pair being connected respectively to the high and low side terminals of a power source, said CMOS pair sources being separated from said terminals by limiting transistors having their drains in series with the source/-drains of said CMOS pairs, sources of each P channel transistor in said CMOS pairs being separated from one of said power source terminals by a P channel limiting transistor, sources of each N channel transistor in said CMOS pairs being separated from the other of said power source



terminals by an N channel limiting transistor, the gates of said P channel limiting transistors being connected together and the gates of said N channel limiting transistors being connected together, and means for providing a variable bias on the gates of said limiting transistors;

first frequency divider means for dividing down an output frequency signal from said oscillator circuit, the output of said first frequency divider means being a clock signal applied to said line driver circuits for selecting individual lines in succession;

phase comparison means, said comparison means determining the difference in phase of a output of said first frequency divider means with the phase of a horizontal synchronizing signal, said horizontal synchronizing signal being a portion of a television signal transmission, an output of said comparison means being fed back to said oscillator circuit, said feedback being in proportion to said phase difference, said oscillator circuit being adapted to adjust the output frequency of oscillation in response to said phase difference signal, said adjustment causing said phase difference to approach zero, said clock signals being synchronized with said horizontal synchronizing signal.

4,496,978

NOISE DETECTING CIRCUIT AND TELEVISION RECEIVER EMPLOYING THE SAME

Junji Sakamoto, and Hiroyasu Kishi, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Feb. 22, 1982, Ser. No. 351,224
Claims priority, application Japan, Feb. 27, 1981, 56-28579
Int. Cl.³ H04N *5/08*
U.S. Cl. 358—155 **15 Claims**

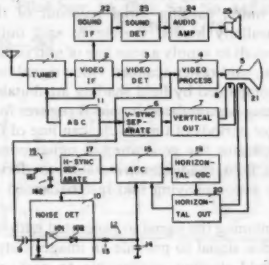
1. A noise detecting circuit for detecting a noise component in a composite video signal including a synchronizing signal of a television signal, comprising:

composite video signal providing means for providing said composite video signal,

synchronizing signal separating means operatively coupled to said composite video signal providing means for sepa-

rating a synchronizing signal from said composite video signal provided from said composite video signal providing means,

noise component extracting means responsive to said synchronizing signal obtained from said synchronizing signal separating means for extracting a noise component included during the period of said synchronizing signal in said composite video signal, and



rectifying/smoothing means for rectifying and smoothing the output from said noise component extracting means for providing a direct current voltage associated with the magnitude of said noise component in said composite video signal.

4,496,979

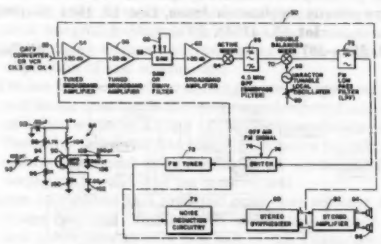
FM HIGH-FIDELITY PROCESSOR

Hong Yu, and Sai W. Kwok, both of Nashua, N.H., assignors to Casat Technology, Inc., Nashua, N.H.

Filed Nov. 22, 1983, Ser. No. 554,446

Int. Cl.³ H04N *5/62*

U.S. Cl. 358—197 **10 Claims**



1. A high-fidelity FM processor operable in response to a first signal having a plurality of subsignals therein, including a desired signal at a first frequency, and providing a signal at a second frequency, comprising:

a first mixer for receiving only said first signal and for generating intermodulation products according to the mixing products of said subsignals;

filter means for selectively isolating a desired intermodulation product including said desired signal from all intermodulation products produced by said first mixer means;

local oscillator means; and

a second mixer receiving the output signals from said filter means and said local oscillator, and producing an output signal at said second frequency.

4,496,980

TWO-DIMENSIONAL SEMICONDUCTOR IMAGE SENSOR WITH REGULATED INTEGRATION TIME

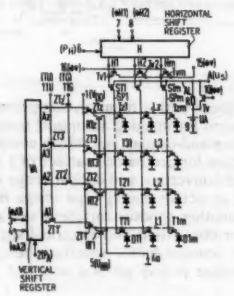
Hans-Joerg Pfleiderer, Zorneding, and Heiner Herbst, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,629

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138294

Int. Cl.³ H04N *3/12*

U.S. Cl. 358—212 **17 Claims**



1. A two-dimensional semiconductor image sensor comprising:

a plurality of light-sensitive sensor elements for generating charge carriers in response to light incident thereon, said sensor elements disposed in rows and columns on a semiconductor substrate;

a plurality of row lines respectively connecting all sensor elements in each of said rows;

a plurality of column lines respectively connecting all sensor elements in each of said columns;

a vertical shift register having a plurality of parallel outputs for sequentially selecting said rows of sensor elements for readout thereof over said column lines at a sensor output;

a plurality of first row selection transistors respectively interconnected between one end of said row lines and a constant voltage, and each having a control electrode;

a plurality of second row selection transistors respectively interconnected between said first row selection transistors and said parallel outputs of said vertical shift register, and each having a control electrode;

a means for selecting said second row selection transistors such that the control electrodes of said first row selection transistors of all oddnumbered rows are connected to respective allocated parallel outputs of said vertical shift register in an alternating sequence with the control electrodes for said first row selection transistors for all evennumbered rows;

a means for periodically connecting said column lines to said sensor output; and

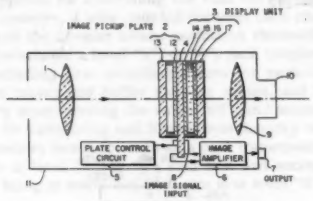
a means for periodically connecting said sensor output to a constant voltage,

whereby all sensor elements in a row are selected for readout an additional plurality of times after an initial readout thereof, said additional readouts of said sensor elements occurring when said sensor output is connected to said constant voltage.

4,496,981
VIDEO CAMERA WITH A MONITOR

Isao Ota, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 351,929, Feb. 24, 1982, abandoned.
This application Jul. 5, 1984, Ser. No. 626,594
Claims priority, application Japan, Feb. 26, 1981, 56-27719
Int. Cl.³ H04N 5/26
U.S. Cl. 358—213 9 Claims

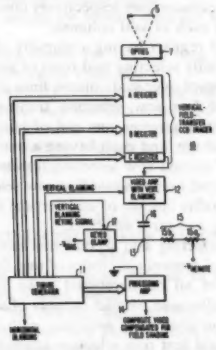


1. A video camera with a monitor, comprising:
an optical system for imaging an optical image;
an image pickup-and-display unit which comprises an image pickup portion formed on one surface of a semiconductor substrate for converting said optical image to an electrical signal, and an active matrix type image display portion formed on another opposite surface of said semiconductor substrate for converting said electrical signal to a visual image, said semiconductor substrate being common to both said image pickup portion and said image display portion;
an image pickup portion control circuit for controlling said image pickup portion.

4,496,982
COMPENSATION AGAINST FIELD SHADING IN VIDEO FROM FIELD-TRANSFER CCD IMAGERS

Peter A. Levine, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,422
Int. Cl.³ H04N 5/34
U.S. Cl. 358—221 28 Claims

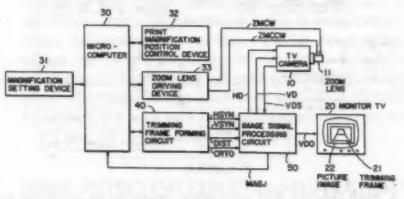


28. In combination,
a CCD imager of field transfer type having an image or A register, a field storage or B register, an output or C register, and an output stage receptive of serial read-out of charge packets from said C register for supplying raster-scanned video signal with relatively long field trace and relatively short field retrace;
means applying synchronous clocking voltages to said A and B registers during each field retrace time for transferrring charge packets descriptive of image integrated in said A register during the preceding field trace from said A register to said B register;
means applying clocking voltages to said B register during line retrace times for advancing charge packets therein a line at a time and displacing a line of charge packets therefrom to parallelly load said C register;
means applying clocking voltages to said C register during line trace times, causing serial read-out of the charge packets parallelly loaded therein to said output stage, which responds to supply a scan line of said raster-scanned video signal, said raster-scanned video signal being undesirably accompanied by field shading attributable to dark currents being accumulated in said B register for progressively longer periods of time each scan line of field trace;
improved apparatus for generating a signal compensating against the field shading attributable to dark currents undesirably accompanying said raster-scanned video signal; and
means for combining the signal so generated with said raster-scanned video signal to provide an imager output signal, in which field shading attributable to dark currents is suppressed, which improved apparatus includes, in addition to
means for generating a waveform having consistent slope through a field interval for suppressing said field shading attributable to dark currents, the following:
means applying clocking voltages to said C register during at least portions of field retrace times, causing serial read-out of charge packets therein to said output stage, which responds to dark current accumulated in said B register during preceding field trace times to supply a remnant dark current signal; and
means controlling the amplitude of said waveform in response to, said remnant dark current signal for compensating for temperature changes of said CCD imager, in suppressing said field shading attributable to dark currents.

4,496,983
TRIMMING AREA CONTROL SYSTEM IN PHOTO-PRINTING

Yuji Takenaka, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Nov. 29, 1982, Ser. No. 445,176
Claims priority, application Japan, Dec. 10, 1981, 56-198924
Int. Cl.³ H04N 1/04, 1/46, 3/08
U.S. Cl. 358—287 23 Claims



1. A trimming area control system for a photo-printer of the type capable of printing pictures at variable magnifications which is characterized in that the picture image of a negative film is picked up by a TV camera provided with a zoom lens so that the trimming scope can be monitored by a monitor TV, and that a video signal from said TV camera with the zoom lens which corresponds with aperture portion of a carrier of said negative film is combined with a position reference signal which arbitrarily scans the negative image picked up by said TV camera with the zoom lens either in vertical direction or in horizontal direction so as to drive and control the zoom lens using the position where said position reference signal coin-

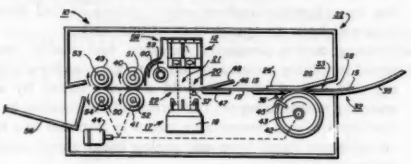
cides with the carrier aperture portion of said video signal as a designated value.

4,496,984

RASTER INPUT/OUTPUT SCANNER

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 18, 1982, Ser. No. 442,555
Int. Cl.³ H04N *1/10*
U.S. Cl. 358—293 **2 Claims**



1. A combined raster input and raster output scanner comprising in combination:

(a) a combined image reading and printing station;

(b) means to feed a document to be read in unison with copy substrate material to be printed to said station;

(c) means to illuminate at least a line-like portion of the document at said station;

(d) an image read bar operatively disposed at said station, said read bar having at least two substantially parallel rows of image sensors for scanning line-like portions of the document at said station, the centerlines of the sensors forming one of said rows being offset from the centerlines of the sensors forming the other of said rows, said sensors generating image signals representative of the document images scanned, and means forming individual optical paths for each of said sensors for transmitting image rays from the document images scanned at said station to said sensors; said optical path forming means including individual lens means for each of said sensors in said arrays for focusing said sensors onto a substantially common image line;

(e) an image print bar operatively disposed at said station, said print bar having at least two substantially parallel rows of individual imaging elements for printing images on said copy substrate material at said station in response to an image signal input, the number and arrangement of said imaging elements corresponding to the number and disposition of said sensors; and

(f) means for operatively coupling the image signal output of said image read bar to the image signal input of said image print bar whereby a copy of the document image is produced by said print bar imaging elements on said copy substrate material concurrently with scanning of said document by said read bar sensors; and

means to oscillate said read and print bars between a first image read and print position where said scanner reads and prints substantially one half of the image/copy line being processed and a second image read and print position where said scanner reads and prints the remainder of said image/copy line.

4,496,985

LINE-LOCKED DIGITAL FLUOROGRAPHY SYSTEM

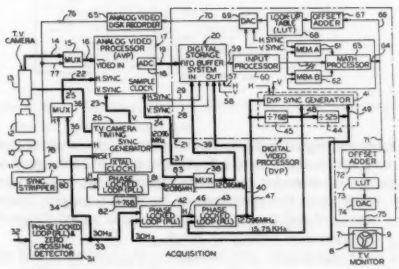
Gerald A. Jensen, Dousman; William H. Wesbey, New Berlin, and Stephen J. Riederer, Wauwatosa, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,552
Int. Cl.³ H04N *5/32*
U.S. Cl. 358—111 **6 Claims**

1. Resettable sync generator means for a digital fluorography system, the system being supplied from an ac power source and including a television (TV) camera whose target is scanned to convert X-ray image frames to corresponding analog video signals, an analog-to-digital converter (ADC) for converting successive samples of the analog video signals to digital pixel words having values corresponding to the intensities of the picture elements (pixels) that compose the lines of the frames, means for subtracting an image frame from another frame in a sequence of frames, and means for providing reset signals referenced to the ac power source frequency, said sync generator means being characterized by its capability for maintaining registration between corresponding pixels in different image frames and comprising:

crystal controlled oscillator means for providing a sample clock pulse train for controlling the pixel sampling frequency of said ADC,

pixel counter means having an input for said sample clock train and being operative to count off the number of pixels composing each horizontal video line, said counter responding to reset signals by starting the count of the pixels in a line,



means for providing to said counter means said reset signals to thereby start counting the first and subsequent pixels in the first horizontal line in a frame,

means operative to provide the horizontal timing signals for the TV camera in accordance with the states of said counter means and to provide clock signals related to the horizontal line rate of a frame,

horizontal line counter means controlled by said clock signals to produce counts corresponding to the horizontal lines following the start of a frame, said horizontal line counter means responding to each of said reset signals by resetting to start a new count simultaneously with said pixel counter being reset to count the first pixel in the first horizontal line in a new frame regardless of whether the full number of pixels in the line at the end of the preceding frame have been counted, and

means operative to provide the vertical timing signals for said TV camera in accordance with the state of said horizontal line counter means.

4,496,986

SUBSCRIPTION TELEVISION INTERFACE

Eugene Lubchenko; Leander H. Hoke, Jr., both of Knoxville, and Richard J. Burton, Morristown, all of Tenn., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1983, Ser. No. 457,308
Int. Cl.³ H04N *7/16*
U.S. Cl. 358—114 **8 Claims**

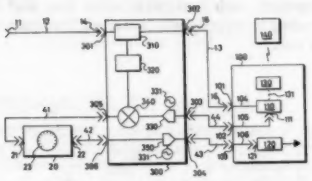
1. An interface for use with television receiver, which television receiver includes a tuner for selecting one of a plurality of programs each carried on a separate carrier frequency within the television broadcast band and converting the selected program to an intermediate frequency carrier and an intermediate frequency amplifier for amplifying signals within a predetermined frequency band about said intermediate frequency carrier, and converter/decoder means for converting pro-

grams carried on a selected carrier frequency to a first predetermined carrier frequency in the television broadcast band and for decoding program information carried thereon, which converter/decoder means has an input port for receiving signals to be converted and decoded and an output port at which the converted and decoded program appears, said interface comprising:

splitter means for receiving a plurality of encoded program signals, each carried on a different carrier frequency within the television broadcast band, and for dividing said encoded program signals into first and second substantially identical components;

a first signal path for transmitting said first program signal component to the input port of said tuner;

a signal adder having two input ports and an output port, the signal at the output port being the sum of the signals at the input ports;



a second signal path for transmitting said second program signal component to a first input port of said signal adder;

an upconverter for converting the program selected by said tuner from the intermediate frequency carrier frequency output of said tuner to second predetermined frequency in the television broadcast band;

a third signal path for transmitting the output of said upconverter to a second input port of said signal adder;

a fourth signal path for transmitting the output of said signal adder for input to said converter/decoder means,

a downconverter for converting program signals produced by said converter/decoder means at the output port thereof to said intermediate frequency carrier, and

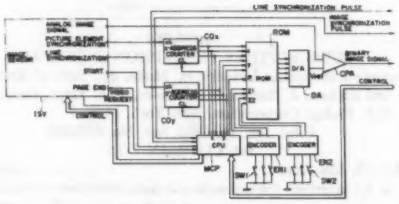
a fifth signal path for transmitting the output of said downconverter for input to said intermediate frequency amplifier.

4,496,987

CONVERSION OF AN ANALOG IMAGE SIGNAL INTO A BINARY IMAGE SIGNAL

Kazuhiro Yuasa, Zama; Shuichi Takahashi, and Mitsuru Kondo, both of Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Oct. 2, 1981, Ser. No. 308,088
Int. Cl.³ H03K *13/00*
U.S. Cl. 358—283 **3 Claims**



1. A system for converting an analog image signal into a binary image signal which is capable of representing tone differences when the corresponding visual image is reproduced, comprising:

storing means for storing a first plurality of threshold array sets, each set being different in array pattern and including a second plurality of threshold arrays which is the same in array pattern but different in threshold level, each threshold of each of said threshold arrays corresponding to a picture element;

comparator means having a pair of first and second inputs, said first input being connected to receive threshold information from said storing means as a reference threshold;

analog image signal supplying means for supplying an analog image signal to said second input of said comparator means;

selecting means connected to said storing means for selecting one of said threshold arrays stored in said storing means to be in an operative condition; and

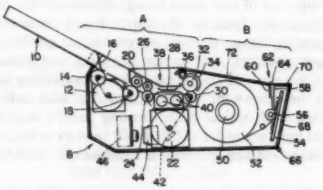
addressing means connected between said analog image signal supplying means and said storing means for addressing said one of said threshold arrays selected by said selecting means to supply the threshold information to the first input of said comparator means in response to a synchronization signal from said analog image signal supplying means.

4,496,988

COPYING MACHINE

Haruhiko Moriguchi, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,109
Claims priority, application Japan, Dec. 10, 1980, 55-174078
Int. Cl.³ H04N *1/22*
U.S. Cl. 358—294 **3 Claims**



1. A copying machine of the type comprising a reading section for reading image data from an original at a reading station and generating an image data signal, a recording section for reproducing an image of said original on a recording medium at a recording station in accordance with recording signals, and a read/record control section for receiving said image data signal from said reading section and providing said recording signals to said recording section in accordance with said image data signals, the improvement comprising:

a copy machine body incorporating therein said reading and recording sections;

a read/record body portion external of said copy machine body and positionable separately therefrom and containing said read/record control section; and

wherein said reading section comprises an automatic original feeding device for feeding originals to said reading station, image sensors, at least one lens for receiving light reflected from an original and passing said reflected light to said sensors to read image data of said original, a turn-over roll for receiving an original downstream of said reading station with a first surface of said original facing in a first direction, and a discharging roll which cooperates with said turn-over roll to discharge said original through an upper part of said copying machine with said first surface facing substantially an opposite direction, and wherein said recording section comprises a heat-sensitive recording sheet supply, recording sheet feeding means for feeding said heat-sensitive recording sheet from said supply to said recording station, and a heat-sensitive recording head

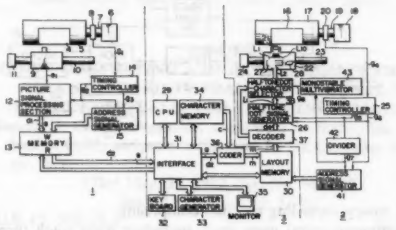
for reproducing image data on said heat-sensitive recording sheet under control of said recording signals from said read/record control section.

4,496,989

METHOD FOR COMPOSING AND RECORDING A PICTURE AND A CHARACTER BY USING PICTURE SIGNALS AND CHARACTER SIGNALS FOR USE IN A PICTURE REPRODUCING MACHINE

Makoto Hirosawa, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 21, 1982, Ser. No. 390,373
Claims priority, application Japan, Jul. 16, 1981, 56-111111
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—296 **10 Claims**



1. A method for the economical recording and reproducing of images including (1) picture areas of low spatial resolution having a wide gradation of intensity levels, and character or letter areas which are black or white but have higher spatial resolution requirements comprising the steps of:

(1) recording the picture area elements of a first predetermined size with a substantially continuous gradation of intensity, in digital format;

(2) recording the character or letter areas by subdividing the said predetermined picture element size to smaller areas of a second predetermined size, together with indications as to whether each of the smaller areas are black or white, in digital format;

(3) including as part of the recorded digital format for the recorded information one bit which indicates whether the recorded information represents a picture area as noted in (1) hereinabove, or a character or letter area as noted in (2) hereinabove; and

(4) decoding and generating a new physical representation of the combined picture and character or letter areas, with the picture areas being reproduced in multiple intensity gradations with relatively coarse spatial resolution, and the character or letter areas being reproduced in half-tone or black and white with relatively fine spatial definition or resolution.

4,496,990

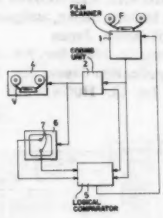
METHOD AND APPARATUS FOR COPYING CINEMATOGRAPHIC FILM ONTO COLOR VIDEO TAPE

Tomas Dyfverman, Vasavägen 8, S-171 39 Solna, Sweden

Filed Jul. 26, 1982, Ser. No. 401,545
Claims priority, application Sweden, Aug. 21, 1981, 8104965
Int. Cl.³ H04N *9/11*
U.S. Cl. 358—310 **9 Claims**

1. A method for copying a cinematographic film onto colour video tape, comprising the steps of feeding the film through a telecine equipment in which the picture frames of the film are scanned electronically in sequence and an electronic picture signal containing the picture information of the film picture frames is generated and said picture signal is coded in accordance with the colour video system used so as to provide a composite video signal which includes at least one periodic signal component having a period extending over en integral number of film picture frames; and recording said composite video signal onto a video tape, in which method

before feeding the film into the telecine equipment, a film leader is spliced onto one end of the film, said film leader being provided with a periodically repeated sequence of at least two sequential picture frames, each having a picture content which is clearly different from the other, it being ensured when splicing said leader to said film that said picture frame sequence has a predetermined position relative to the picture frames on the actual film;



the film is fed into the telecine equipment with said film leader entering first; and

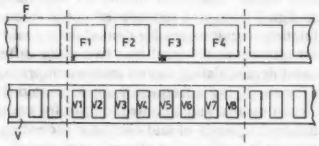
while the leader is being fed through the telecine equipment, the current picture content of said picture signal is compared with said periodic signal component in order to establish whether or not the picture content of the picture signal has a given desired phase position relative to said periodic signal component, before the copying of the actual film onto the video tape is commenced.

4,496,991

METHOD IN THE EDITING OF KINEMATOGRAPHIC PICTURE MATERIAL

Tomas Dyfverman, Vasavägen 8, S-171 39 Solna, Sweden

Filed Apr. 6, 1982, Ser. No. 365,983
Claims priority, application Sweden, Apr. 14, 1981, 8102411
Int. Cl.³ H04N *5/87, 9/491*
U.S. Cl. 358—311 **7 Claims**



1. A method for editing kinematographic colour picture material which in its finalized form shall be in the form of a colour video tape, comprising the following procedural steps:

(a) using the originally shot picture material, which may be in the form of either colour film or colour video tape, for producing a copy in the other material form, so as to obtain a film copy and a video tape copy having the same picture content;

(b) providing the film copy throughout its length with periodically occurring, visual markings from which it is possible, with the guidance thereof, to determine for each film frame the location of the corresponding video fields on the video tape copy within the periodic video field sequence of the video system being used;

(c) storing the video tape copy as an original;

(d) using the film copy as a work print to produce an edited film comprising a desired sequence of desired scenes,

while ensuring with the guidance of said markings that at each splice between two mutually sequential scenes the last frame in the preceding scene and the first frame in the subsequent scene are such that their corresponding video fields on the video tape copy have immediately following locations in said periodic video field sequence of the video signal; and

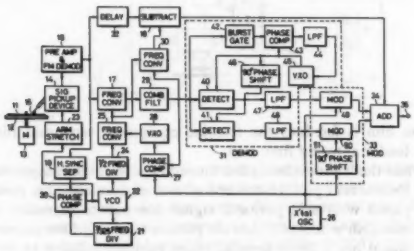
(e) using the video tape copy for producing an edited video tape in exact conformity with the edited film.

4,496,992

COLOR VIDEO SIGNAL REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 22, 1982, Ser. No. 341,635
Claims priority, application Japan, Jan. 26, 1981, 56-9920
Int. Cl.³ H04N *9/493*
U.S. Cl. 358—326 **2 Claims**



1. A color video signal reproducing apparatus comprising:

frequency converting means for frequency-converting a color video signal reproduced from a recording medium;

reference signal producing means for producing a reference signal;

means responsive to said reference signal for producing a frequency converting signal which is supplied to said frequency converting means;

carrier chrominance signal separation means responsive to said frequency converting means for separating a carrier chrominance signal from a color video signal;

luminance signal separation means for separating a luminance signal from said reproduced color video signal;

demodulating circuit means for demodulating said separated carrier chrominance signal into two color difference signals, said demodulating circuit means comprising an oscillator for supplying a frequency signal to said demodulating circuit means, and a control circuit for controling the oscillation frequency of said oscillator according to a jitter component in said carrier chrominance signal;

modulating circuit means for modulating the reference signal from said reference signal producing means by the color difference signals from said demodulating circuit means; and

color video signal obtaining means for obtaining a color video signal by adding an output signal of said modulating circuit and said separated luminance signal,

said frequency converting means comprising a first frequency converter means for frequency-converting said reproduced color video signal,

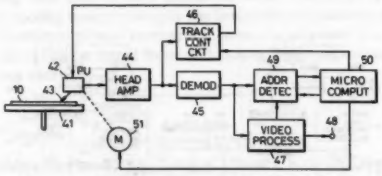
said frequency converting signal producing means comprising a second frequency converter for supplying a frequency-converting signal to said first frequency converter, horizontal synchronizing signal separation means for separating a horizontal synchronizing signal from the reproduced color video signal, a voltage controlled oscillator responsive to said separated horizontal synchronizing signal for supplying an output signal to said second frequency converter, and a voltage controlled crystal oscillator responsive to a phase difference between the phases of the separated carrier chrominance signal and the output signal of said reference signal producing means for supplying an output signal to said second frequency converter.

4,496,993

ROTARY RECORDING MEDIUM

Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abé, both of Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 6, 1982, Ser. No. 375,535
Claims priority, application Japan, May 12, 1981, 56-70944
Int. Cl.³ G11B *27/00*; H04N *5/76*
U.S. Cl. 358—335 **7 Claims**



1. A rotary recording medium comprising:

a continuous spiral main track including main track turns having an information signal and an address signal recorded thereon, said address signal being a signal based upon a first coding system for representing a location of the information signal on the main track turns; and

a continuous spiral lead-in track including lead-in track turns having no information signal recorded thereon,

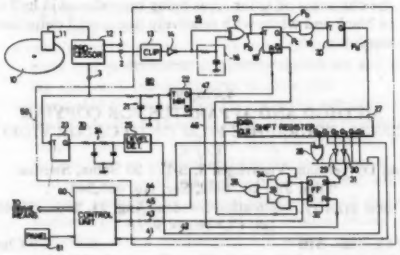
said lead-in track turns having an address signal recorded thereon based upon a second coding system which is different from the first coding system for representing a location of the lead-in track turns.

4,496,994

NOISE IMMUNE DATA REGENERATING CIRCUIT FOR VIDEO SIGNAL REPRODUCTION

Kenji Kaneko, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jun. 25, 1982, Ser. No. 392,303
Claims priority, application Japan, Jun. 27, 1981, 56-99860
Int. Cl.³ H04N *5/94*
U.S. Cl. 358—336 **4 Claims**



1. A system for reproducing a recording medium having a composite video signal framed at vertical blanking intervals including vertical and horizontal synchronization pulses and digital control data recorded in specified portions of the vertical blanking interval which are subsequent to said vertical synchronization pulse, comprising:

manual control means for processing said digital control data and including means for generating first clock pulses;

a shift register;

first means for deriving second clock pulses from said control data;

third means for detecting when said digital control data are stored in said shift register;

fourth means for detecting the presence of randomly occurring noise pulses which might occur in said vertical blanking intervals and generating therefrom a disabling signal; and

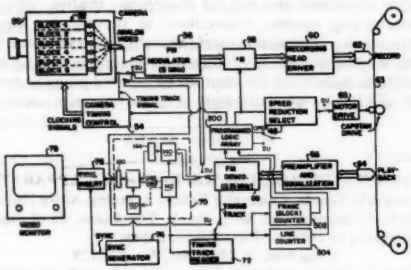
fifth means responsive to said vertical synchronization pulse to cause said shift register to respond to said second clock pulses by successively storing said control data therein and subsequently responsive to said third means in the absence of said disabling signal to cause said shift register to respond to said first clock pulses by delivering the stored control data to said manual control means.

4,496,995

DOWN CONVERTING A HIGH FRAME RATE SIGNAL TO A STANDARD TV FRAME RATE SIGNAL BY SKIPPING PRESELECTED VIDEO INFORMATION

Joseph H. Colles, Oceanside, and James A. Bixby, San Diego, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,319
Int. Cl.³ H04N *5/92, 5/782*
U.S. Cl. 360—9.1 **13 Claims**



1. In fast frame recorder apparatus having a video camera operative at a first relatively high frame rate, a video monitor operative at a second lesser frame rate, a recorder for recording the relatively high frame rate camera signal on a recording medium operative at a given recording speed, and for playing back said recorded signal at a lesser speed to down-convert the relatively high frame rate of said camera signal to said second frame rate, and means for applying the down-converted frame rate signal to said monitor for displaying the scene associated with said camera signal on said monitor, the improvement of ancillary means for down-converting the frame rate of said camera signal to said second frame rate, and for selectively applying the down-converted frame rate signal of said ancillary means to said monitor, thereby allowing the camera of said fast frame recorder apparatus to be adjusted, while viewing said monitor, without need to record and play back said camera signal at differing speeds,

said ancillary means for down-converting the frame rate of said camera signal comprising means for receiving the camera output signal and for selectively applying predetermined portions of such signal to said monitor,

said means for applying predetermined portions of the camera signal to said monitor being means for applying signals corresponding to one or more lines from each camera frame to said monitor,

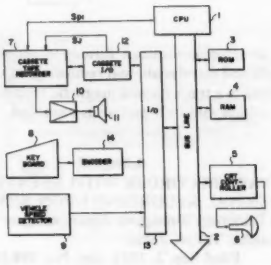
said fast frame recorder apparatus further comprising means for selectively applying to said monitor signals corresponding to a different line or lines from each frame of successive groupings of frames.

4,496,996

RUNNING GUIDE SYSTEM

Masakazu Moriyama, and Takao Saito, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 15, 1982, Ser. No. 368,813
Claims priority, application Japan, Jun. 15, 1981, 56-91966
Int. Cl.³ G11B *5/00*
U.S. Cl. 360—12 **2 Claims**



1. A running guide system for a motor vehicle comprising:

running distance detecting means for detecting an actual running distance travelled by the motor vehicle;

memory means for storing a plurality of maps arranged according to a predetermined sequence illustrating a route from a start point to a destination, each of said maps containing a segment of said route and overlapping with a segment of an adjacent map in said sequence;

display means for displaying each map stored in said memory means;

changing means, connected to said running distance detecting means, memory means and display means, for changing a map currently displayed by said display means to a next map in said sequence of maps showing a next segment of said route when the actual running distance coincides with a predetermined running distance of the currently displayed map;

tape recorder means for playing a cassette tape and generating a tape signal for causing the display of a map by said display means;

judging means, responsive to the tape signal, for judging whether or not the tape signal is indicative of a music tape or a map information tape; and

rewinding means, responsive to a signal from said judging means, for fully rewinding said cassette tape to a beginning point thereof when an indication of the map information is judged by said judging means.

4,496,997

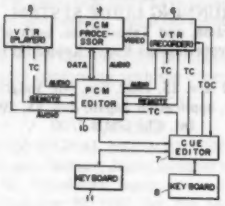
CUE DATA RECORDING APPARATUS

Tadashi Ohtsuki, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,684
Claims priority, application Japan, Sep. 14, 1981, 56-145286
Int. Cl.³ G11B *27/02, 5/86*
U.S. Cl. 360—13 **25 Claims**

1. Apparatus for recording cue data identifying predetermined characteristics of information recorded in tracks on a magnetic tape, said apparatus comprising playback means for playing back said information; code signal generating means for generating code signals having a predetermined relationship with the played back information; cue signal generating means for generating respective cue signals upon the occur-

rence of respective ones of said predetermined characteristics in the played back information; memory means for storing said code signals and said cue signals; format means for producing



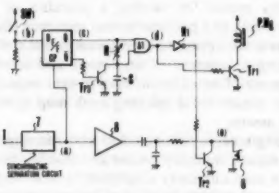
cue data in a predetermined format in accordance with the stored code and cue signals; and recording means for recording said cue data in a track on said magnetic tape different from the tracks in which said information is recorded.

4,496,998

VIDEO TAPE RECORDER WITH DELAYED CONTROL SIGNAL RECORDING UPON RESTART

Hiroyuki Takimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,180
Claims priority, application Japan, Sep. 4, 1980, 55-122863
Int. Cl.³ H04N *5/782*
U.S. Cl. 360—33.1 **5 Claims**



1. A video signal recording and reproducing apparatus, comprising:

(a) carrying means which carries a recording medium at a predetermined speed during a video signal recording and reproducing mode;

(b) changeover means for forming signals for starting or stopping carrying actions of the carrying means;

(c) signal forming means for forming control signals which serves as a reference in a running speed control of said carrying means at a time of reproduction of video signals;

(d) recording means for recording said control signals on a recording medium during the video signal recording mode;

(e) prohibiting means for prohibiting the recording of said control signals during a period of time from the stopping of the carrying action until a restarting of the same in the video signal recording mode; and

(f) delay means for making the carrying means to restart the carrying action after the elapse of a prescribed delay time from the forming of the control signal after the forming of the start signal;

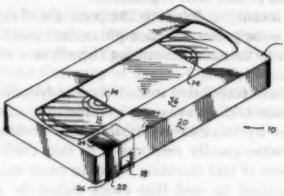
wherein said delay means includes means for setting said delay time so that an interval on the recording medium of the last control signal recorded before the stopping of the carrying action and the first control signal recorded after the restart of the carrying action is two or more times greater than the distance between two previously recorded control signals recorded when said recording medium is driven with said predetermined speed.

4,496,999

VIDEO TAPE CASSETTE AND DEVICE THEREFOR

Mario W. Espin, 2301 Winthrop Ave., Charlotte, N.C. 28203

Filed Sep. 10, 1982, Ser. No. 416,568
Int. Cl.³ G11B *15/04*
U.S. Cl. 360—60 **4 Claims**



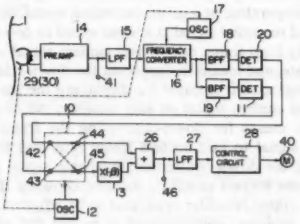
1. In a video tape cassette of the type having a box-shaped tape housing containing a supply of video recording tape and an antirecording opening formed in one side of said housing operable when said cassette is operatively positioned in a tape recording apparatus to prevent overrecording thereby onto said tape, the improvement comprising a three-sided spring clip configured in substantial correspondence to the exterior configuration of said one side of said housing and two sides of said housing adjacent thereto with the three sides of said spring clip being relatively oriented in a relaxed condition at slightly smaller respective angles than the corresponding sides of said housing, said spring clip being snugly engaged resiliently on said one side and said two adjacent sides of said housing for sliding movement into and out of covering relation with said antirecording opening respectively to prevent and permit antirecording operation thereof, whereby said video tape cassette may be selectively employed for recording on said tape thereof as desired and for playback of material prerecorded on said tape thereof without danger of inadvertent overrecording.

4,497,000

MAGNETIC RECORDING/REPRODUCING APPARATUS

Toshimichi Terada, Chigasaki; Keiichi Komatsu; Akira Shibata, both of Katsuta, and Kenji Satoh, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 471,129
Claims priority, application Japan, Mar. 3, 1982, 57-32452
Int. Cl.³ G11B *5/55*
U.S. Cl. 360—70 **4 Claims**



1. A magnetic recording/reproducing apparatus for sequentially recording each of a plurality of pilot signals of different frequencies on each video track to be multiplexed with a video signal, and sequentially reproducing the recorded video signal and the pilot signals, said apparatus comprising:

pilot-signal separating means for separating an output signal reproduced by video heads into said video signal and said pilot signals and producing only said pilot signals; first level detecting means for detecting the level of the pilot

signal on the right adjacent video track from said pilot signals supplied from said pilot signal separating means;

second level detecting means for detecting the level of the pilot signal on the left adjacent video track from said pilot signal supplied from said pilot signal separating means;

subtracting means for subtracting between the output signal from said first level detecting means and the output signal from said second level detecting means so as to produce a tracking control signal;

first signal supplying means for supplying the output signal from said first level detecting means to said subtracting means;

second signal supplying means for supplying the output signal from said second level detecting means to said subtracting means; and

adjusting means for adjusting the level of a signal which at least one of said first and second signal supplying means handles.

4,497,001

AUTO-REVERSE MECHANISM FOR USE IN MAGNETIC RECORDING/REPRODUCING APPARATUS

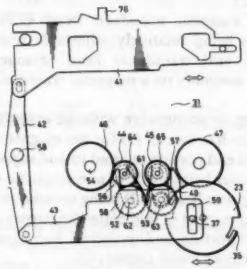
Hideki Hayashi; Sadayoshi Endo; Yukio Ito, and Satoshi Takagi, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,186

Claims priority, application Japan, Jul. 10, 1981, 56-107744; Jul. 10, 1981, 56-107745; Jul. 10, 1981, 56-107746; Jul. 10, 1981, 56-107747; Jul. 14, 1981, 56-103444[U]; Jul. 14, 1981, 56-103445[U]

Int. Cl.³ G11B *15/44*

U.S. Cl. 360—74.2 **8 Claims**



1. An auto-reverse mechanism intended to be used in a magnetic recording/reproducing apparatus, comprising:

a means for changing the driving force to the reel base of said magnetic recording/reproducing apparatus;

a means for detecting the stopped rotation of said reel base;

a power gear provided with an intermittent gear section;

a means operative in response to the operation of detection of said detection means to rotate said power gear;

a change plate;

a means for actuating said changing means and change plate under the effect of the rotation of said power gear;

a gear for driving said reel base; and

a means operative in response to the movement of said change plate to attract said intermittent gear section so that said power gear will be engaged with said reel-base driving gear.

4,497,002

METHOD OF AND APPARATUS FOR DRIVING A DISK STORAGE

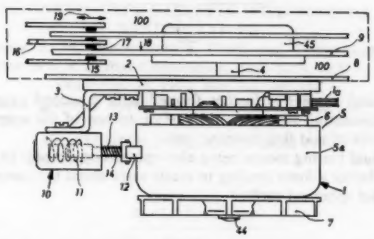
Johann von der Heide, Mönchweiler, and Bernhard Schuh, Georgen, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 095,536, Nov. 19, 1979, abandoned. This application Mar. 29, 1982, Ser. No. 363,135

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917385

Int. Cl.³ G11B *5/012*

U.S. Cl. 360—97 **7 Claims**



1. In a digital information-storage apparatus of the type having a read and/or write head which inscribes information bits onto, and/or reads them from, at least one data storage disk which is rotated at high speed relative to such head by means of a rotary disk-holding structure comprised of a disk-support member configured to be accommodated in the large central aperture of such disk for transmitting rotation thereto,

the combination with said rotary disk-support member of a motor-brake system, the system comprising

an external-rotor motor,

the motor having a stationary part and a rotating part,

the rotating part comprising an axially extending rotor shaft and a rotating cup-shaped rotor housing having an outer surface provided with a braking surface portion,

the stationary part of the motor including a mounting flange which is generally planar and extends normal to the axis of the rotor shaft,

the rotor shaft extending axially in a first direction from the stationary mounting flange to the rotary disk-support member at a first axial side of the mounting flange,

and a brake mounted on the stationary part of the motor and located spaced from the mounting flange in an opposite second axial direction and thus located at the opposite second axial side of the mounting flange,

the brake including a braking part movable into and out of braking engagement with the braking surface portion of the rotor housing.

4,497,003

DISC POSITIONING DEVICE

Masayuki Abe, Yokohama; Junichi Ikoma, Yokosuka, and Kenzi Abiko, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,277

Claims priority, application Japan, Jun. 10, 1981, 56-88124

Int. Cl.³ G11B *5/012, 5/82;* B65D *85/30*

U.S. Cl. 360—97 **1 Claim**

1. A disc positioning device comprising:

(a) a spindle connected to a drive source of a disc;

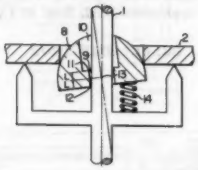
(b) an adapter mounted on said spindle formed with an inclined surface engaging the edge of a center opening formed in said disc; and

(c) biasing means urging said adapter against said disc; wherein the improvement resides in that:

(d) said inclined surface is constituted by a part of a spherical

surface of a diameter greater than that of the center opening of said disc;

(e) said adapter is formed inside said spherical surface with a first opening having end portions constituting opposite ends of said adapter in the form of circles greater in diameter than said spindle, a straight line connecting the centers of said circles together being bisected at the center of said spherical surface;



(f) said adapter is further formed with a second opening connecting said spherical surface to one of the opposite ends of said first opening; and

(g) said biasing means being also operative to impart to said adapter a force tending to rotate same about the center of said spherical surface.

4,497,004

PICTURE REPRODUCING APPARATUS IN A HELICAL SCANNING VIDEO TAPE RECORDER

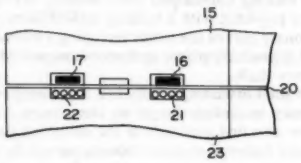
Akira Shibata; Makoto Konosu; Teizo Tamura; Koichi Hirose, all of Katsuta; Kuniaki Miura, Ibaraki; Noboru Kojima, and Kelichi Komatsu, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,742

Claims priority, application Japan, Jun. 10, 1981, 56-88133; Mar. 29, 1982, 57-49073

Int. Cl.³ G11B *5/52*

U.S. Cl. 360—108 **6 Claims**



1. A picture reproducing apparatus in a helical scanning video tape recorder comprising:

an impedance transformer including a rotary transformer having a rotor core and a stator core having opposed main surfaces which are substantially flat, a rotor winding and a stator winding of said rotary transformer being fitted into a rotor winding slot and a stator winding slot formed on said oppposed main surfaces of said rotor and stator cores, respectively, in a manner that said rotor and stator windings are arranged concentrically with respect to the center of rotation of sid rotor core and opposed to each other, the number of turns of said rotor winding being one turn, and said rotor winding having a rectangular cross-sectional configuration with a length of said rotor winding in a radial direction along said main surface being larger than a length thereof in a direction perpendicular to said main surface;

a video head connected to said rotor winding of said rotary transformer;

a resonance circuit connected to said stator winding side of said rotary transformer;

a pre-amplifier having an input connected to the output of said resonance circuit and an input for supplying a signal to further circuitry; and

means forming a negative resistive feedback path connected between said input of said pre-amplifier and the output of said pre-amplifier.

4,497,005

MULTIPLE MAGNETIC TRANSDUCER HEAD, PARTICULARLY FOR USE WITH MULTI-TRACK VIDEO TAPE RECORDING APPARATUS

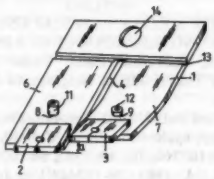
Richard Heinz, Pfungstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,635

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1981, 3121791

Int. Cl.³ G11B *21/24, 5/56*

U.S. Cl. 360—109 **10 Claims**



1. Multiple magnetic transducer head arrangement, particularly for use with multiple track magnetic tape apparatus, having

a plurality of magnetic transducer heads (2,3), said transducer heads being relatively adjustable with respect to each other, said transducer head arrangement being adapted for assembly on a magnetic transducer head support (20),

and comprising, in accordance with the invention,

a common plate-like carrier (1) for the magnetic heads (2,3) having a first end portion secured to said support (20), said common carrier being made of non-magnetic elastic material, the magnetic heads (2,3) being secured side-by-side to a second end portion of said plate-like carrier (1), opposite said first end portion, and separated therefrom by a transversely extending hinge crease (13);

an elongated slit (4) located between the magnetic heads and extending towards the first end portion up to said hinge crease to thereby form respective transducer head support strips (6,7);

and adjustment means (8,9,11,12) located behind the respective magnetic heads for adjustably spacing the respective support strips (6, 7) with respect to the support (20), and spacing the magnetic heads (2,3) with respect to each other by a distance "a" corresponding to a desired distance between adjacent magnetic tracks,

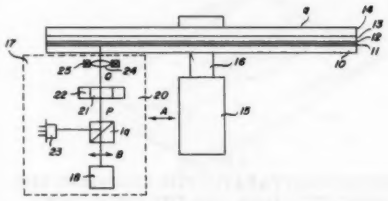
said adjustment means comprising tapped bores (8,9) formed in the strips (6, 7) and positioned behind the transducer heads on the strips close to the transducer heads; and screws (11,12) passing through said tapped bores (8,9) and bearing against the support (20) to space the transducer heads (2,3), individually, by deflection of said strips from said support.

4,497,006

MAGNETO-OPTIC RECORDING/PLAYBACK HEAD ASSEMBLY

Toshihisa Deguchi, Nara; Kenji Ohta, Yao, and Akira Takahashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 2, 1982, Ser. No. 345,056
Claims priority, application Japan, Feb. 6, 1981, 56-17116
Int. Cl.³ G11B *5/32*
U.S. Cl. 360—114 **4 Claims**



1. A head assembly for use in a magneto-optic recording/-playback system, said system including a memory medium having a magnetic coating having a magnetic anisotropy in a vertical direction and wherein a light beam is applied to the memory medium for recording and reproduction of information,

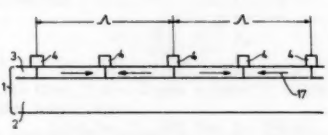
said head assembly comprising a polarizing prism and a Faraday effect element comprising a glass plate in an optical path for said light beam.

4,497,007

MAGNETO-OPTICAL STORAGE PROCESS

Joachim Greiner, Ebenhausen, and Burkhard Nippe, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,828
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110572
Int. Cl.³ G11B *5/32, 9/00;* G11C *11/42;* G01D *15/06*
U.S. Cl. 360—114 **28 Claims**



1. A process for recording and retrieving information of a travelling information carrier including

a layer having a magnetic pigment embedded in a binder convertible into a liquid state by chemical or thermal action, the volume filling factor of said layer being less than 0.25 μm and the thickness of the layer equal to or less than 2μ, or

two magnetic layers on a substrate, consisting of a lower layer for receiving the magnetic information having pigment or metal, having a layer thickness less than 10 μm and a coercive field greater than 8 kAm^{-1} and an upper layer, convertible into a liquid state for production of the diffraction structures by the leakage fields of the lower layer, and containing extremely soft magnetic pigment particles and having a coercive field of less than 4 Acm^{-1},

comprising the steps of

(a) recording on said magnetizable information carrier in the form of a tape, disc or roller by modulating it during its movement with information areas which in one direction of the information plane are greater than 0.2 μm and smaller than 20 μm;

(b) producing a geometrical structure by the action of the magnetic fields of the recorded information on particles of whose greatest longitudinal dimension is less than 0.1 μm, and

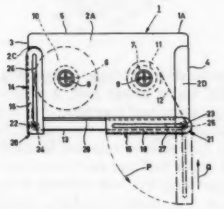
(c) optical scanning said structure, defracting light of wavelength 0.38 to 0.8 μm on the surface of the moving information carrier and producing diffraction images which serve for interpretation of the information.

4,497,008

MAGNETIC-TAPE CASSETTE WITH PIVOTAL, NESTING COVER

Johannes J. M. Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 387,918
Claims priority, application Netherlands, Jun. 16, 1981, 8102877
Int. Cl.³ G11B *23/02, 15/32;* G03B *1/04*
U.S. Cl. 360—132 **9 Claims**



1. A magnetic-tape cassette comprising:

a housing having first and second major walls lying substantially in parallel planes, two side walls, a rear wall and a front side with a front opening between the major walls,

two rotatable reels arranged adjacent each other between the major walls,

a magnetic tape which is attached to the reels, a part of which tape extends across said front opening of the housing for cooperation with parts of a magnetic-tape apparatus, and

at least one front cover formed as a channel section having flanges substantially parallel to said major walls; said cover being constructed to cover, at least partly, the front opening of the housing when in a closed position, and connected to the housing in such a way as to be pivotable between an open position and the closed position about an axis which is disposed perpendicularly to the major walls at or near a front corner of the housing, and slidable relative to the housing between an extended position and a retracted position in which the front cover extends along one of the side walls of the housing,

characterized in that

the flanges of the channel section front cover lie substantially in the planes of the major walls of the cassette housing both in the closed position and in the retracted position of the front cover,

said at least one cover slides in a direction parallel to the adjacent side wall when moving between the extended and retracted positions, and

the outer surfaces of said major walls adjacent said one of the side walls of the housing have recesses formed therein to receive the respective flanges when the front cover is in the retracted position.

4,497,009
MAGNETIC DISK CARTRIDGE

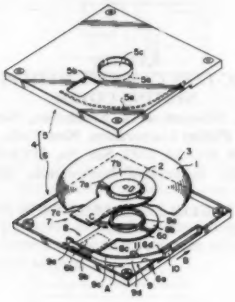
Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Jan. 4, 1984, Ser. No. 568,150

Claims priority, application Japan, Jan. 11, 1983, 58-1943[U]; Jan. 18, 1983, 58-5056[U]; Jan. 18, 1983, 58-5057[U]; Jan. 18, 1983, 58-5058[U]

Int. Cl.³ G11B *23/02*

U.S. Cl. 360—133 **9 Claims**



1. A magnetic disk cartridge comprising a case consisting of an upper half and a lower half, a magnetic disk, means for rotatably supporting said magnetic disk in said case, a strip-like link member positioned for movement along guide grooves extending in face-to-face relation to each other in inner surfaces of said upper half and said lower half, opposite side edge portions of said strip-like link member being engaged with said guide grooves, and shutter members operated by said strip-like link member for opening and closing magnetic head insertion apertures of said case, wherein the improvement comprises a guide member on said lower half projecting upwardly from said lower half towards said upper half, said guide member having a guide surface standing face to face with a part of said guide groove of said lower half for restraining upward movement of said link member the lower side edge portion of which is engaged with said guide groove of said lower half.

4,497,010
ABNORMALITY DETECTING DEVICE

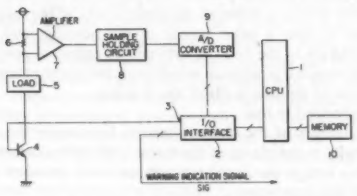
Soukichi Funahashi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,561

Claims priority, application Japan, Oct. 30, 1981, 56-174892

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—93 **2 Claims**



1. An abnormality detecting device for detecting whether a load is in a normal condition or not, comprising: switching means connected with said load in series; control means for controlling said switching means to apply a test voltage to said load for a time so short that said switching means is not damaged even when the load is in a condition of short-circuiting; detecting means for detecting a current through said load upon application of said test voltage and for providing a detection signal; a sample and hold circuit which samples and holds the detection signal; and comparing means for comparing the sampled detection signal with a predetermined abnormality value.

4,497,011
SWITCHING APPARATUS FOR CHANGING THE ABSOLUTE VALUE AND THE PERMANENT MAGNETIZATION DIRECTION OF FERROMAGNETIC BODIES, E.G. OF PERMANENT MAGNETS

Karl Hurtig, Moortwiete 68, 2086 Ellerau, Fed. Rep. of Germany

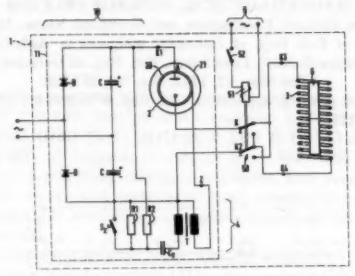
PCT No. PCT/DE82/00096, § 371 Date Jan. 13, 1983, § 102(e) Date Jan. 13, 1983, PCT Pub. No. WO82/04160, PCT Pub. Date Nov. 25, 1982

PCT Filed May 5, 1982, Ser. No. 459,601

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119435

Int. Cl.³ H01H *47/30*

U.S. Cl. 361—147 **20 Claims**



1. A switching unit (1) for changing the absolute value and the direction of the permanent magnetization of ferromagnetic bodies such as permanent magnets, said unit comprising

(a) circuit means for generating current-pulses, and including

(1) an energy-storage system (10) having means for connection to an electrical power source,

(2) firing circuit means (4) connecting said energy-storage system to a first output terminal (K2), and

(3) controllable electronic switch means (A) connecting said energy-storage system to a second output terminal (K), and comprising gas-discharge tube means (2) having an anode and a cathode, each having a respective terminal (K,K1), and also including firing electrode means (20), and

(b) at least one coil (3) adapted to receive a ferromagnetic body (6), said coil terminating at each end in connections (K3,K4) to said output terminals (K,K2),

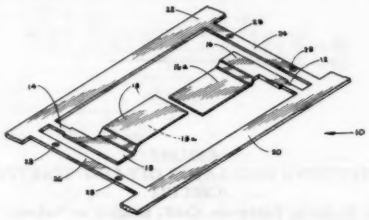
wherein said gas-discharge tube means comprises a flashlamp of a short type designed for high gas pressures and carrying said firing electrode means connected to said firing circuit means on the outside of said tube.

4,497,012

DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Michael M. Gottlieb, Kraainem, Belgium; David S. Fishman, West Hartford, Conn., and Henri Buysse, Lochristi, Belgium, assignors to Rogers Corporation, Rogers, Conn.

Filed Nov. 14, 1983, Ser. No. 551,575
Int. Cl.³ H01G 9/05, 7/00, 4/10
U.S. Cl. 361—306 **26 Claims**



15. A decoupling capacitor including:

a first electrically conductive connection plate having a section of reduced thickness on one side thereof;

a second electrically conductive connection plate having a section of reduced thickness on one side thereof, said sections of reduced thickness facing each other;

a first terminal pin extending from said first connection plate;

a second terminal pin extending from said second connection plate;

said first and second terminal pins being at diagonally opposite locations of the decoupling capacitor;

a capacitive element between the reduced thickness sections of said first and second connection plates, said capacitive element having a pair of conductive face surfaces electrically connected to said sections of reduced thickness;

a molded encapsulating cover encapsulating said connection plates and capacitive element, with said terminal pins extending from said encapsulating cover at a first pair of diagonally opposed positions; and

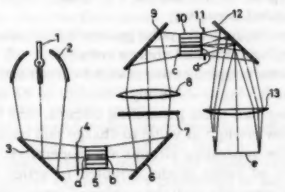
a pair of diagonally opposed stabilizing lugs formed as part of said encapsulating cover, said stabilizing lugs being at a second pair of diagonally opposed positions.

4,497,013

ILLUMINATING APPARATUS

Masakatu Ohta, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,333
Claims priority, application Japan, Jul. 2, 1982, 57-115846
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 **15 Claims**



1. An illuminating apparatus for irradiating a surface, said apparatus comprising:

illuminating means for forming a plurality of secondary light sources;

multi-beam forming optical means for forming multiple light beams from the radiant energy from said secondary light sources;

collimating optical means for substantially collimating the radiant energy from said secondary light sources and directing the radiant energy to said multi-beam forming optical means to be formed as multiple light beams thereby; and

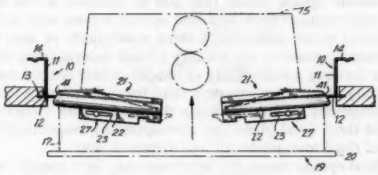
converging optical means for converging the radiant energy as the multiple light beams from said multi-beam forming optical means on the surface to be irradiated.

4,497,014

CEILING FIXTURE HAVING SELF-ACTIVATING MOUNTING MEANS

Leonard E. Woloski, Jersey City, and Walter E. Wyles, Somerset, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Continuation-in-part of Ser. No. 426,173, Sep. 28, 1982, Pat. No. 4,424,554. This application Oct. 3, 1983, Ser. No. 538,270
Int. Cl.³ F21S 1/02
U.S. Cl. 362—150 **8 Claims**

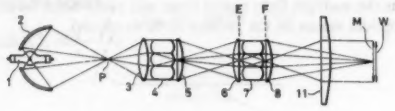


1. An automatic trip recessed lighting fixture adapted to be mounted between and supported on parallel grids of a ceiling tile support structure, said grids being spaced a predetermined distance apart, comprising a generally rectangular downwardly open light housing having side walls, end walls and a top wall, each of said side walls having moveably mounted thereon a support latch assembly shiftable on a path parallel to said side walls between a partially retracted position whereat the distal ends of said latch members extend a first distance beyond said end walls, a retracted position whereat the distal ends of said latch members extend a lesser distance than said first distance beyond said end walls, and a projected position whereat said distal ends extend a greater distance than said first distance beyond said end walls, the spacing between the distal ends of said latch assemblies on each said wall being greater than said predetermined distance in said partially retracted position, substantially equal to said predetermined distance in said retracted position, and substantially greater than said predetermined distance in said projected position of said latch assemblies, spring means biased between said latch assemblies and housing and urging said latch assemblies toward said projected position, detent means including complemental portions on said latch assemblies and said housing for retaining said latch assemblies in said partially retracted position in the engaged condition of said complemental portions, cam means on said distal ends of said latch assemblies positioned to coact with a spaced pair of said grids for shifting said latch assemblies from the partially retracted to the retracted position of said latch assemblies, responsive to upward movement of said latch assemblies to a position above said grids and for releasing the complemental portions defining said detent means whereby said latch assembly are shifted from said partially retracted to said projected positions responsive to movement of said latch assemblies to a position above said grids.

4,497,015
LIGHT ILLUMINATION DEVICE

Kunio Konno, Kanagawa, and Masashi Okada, Chiba, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,551
Claims priority, application Japan, Feb. 26, 1982, 57-30268
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—268 **6 Claims**

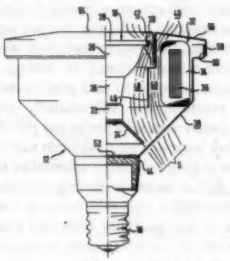


1. A device for uniformly illuminating an object comprising:
(a) means for providing a light source;
(b) first optical means disposed to intersect across light energy emitted from said light source, said first optical means including a first multiplicity of lens elements for forming a multiplicity of images of said light source on a first focal plane and a second multiplicity of lens elements disposed in the vicinity of said first focal plane and corresponding respectively to said first multiplicity of lens elements for forming an image of said first multiplicity of lens elements on a second focal plane;
(c) second optical means disposed to intersect across light energy emitted from said first optical means, said second optical means including a third multiplicity of lens elements disposed in the vicinity of said second focal plane for forming a multiplicity of images of said second multiplicity of lens elements on a third focal plane and a fourth multiplicity of lens elements disposed in the vicinity of said third focal plane and corresponding respectively to said third multiplicity of lens elements; and
(d) third optical means for superimposing light energy emitted from said second optical means on said object.

4,497,016
LIGHTING DEVICE

Christian Sachse, Hildesheim, Fed. Rep. of Germany, assignor to Electrotechnik-Apparatebau Peter Schmitz, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,636
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 8233139[U]
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—294 **13 Claims**

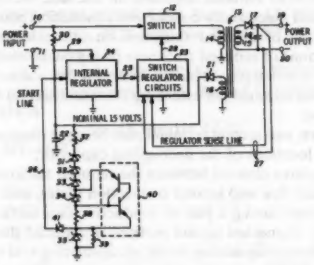


1. A lighting device comprising a low voltage lamp including a reflector and a lamp socket adjoining the reflector, and a toroidal transformer which delivers the feed voltage for the low voltage lamp and which is housed, together with the individual parts of the low voltage lamp, in a housing for the lighting device, characterised in that the housing (12) generally has the contour of a pressed glass lamp with a normed base (18) mounted thereon; in that the toroidal transformer (32) is arranged around the reflector (20) of the low voltage lamp (10) in the light exit side region of the housing (12), which is provided with airflow openings; and in that a substantially cylindrical partition wall (46) is provided between the toroidal transformer (32) and the low voltage lamp (10), with the partition wall (10) being spaced from both the low voltage lamp (10) and the toroidal transformer (32) and forming two air channels (48, 50) for a double chimney.

4,497,017
SWITCHING REGULATOR OFF-LINE STARTING CIRCUIT

Walter R. Davis, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 16, 1983, Ser. No. 495,201
Int. Cl.³ H02P *1/00*
U.S. Cl. 363—49 **8 Claims**

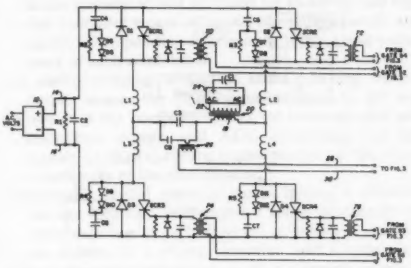


1. In a switching regulator power supply having a d-c input, a level shifting transformer, a pulse width modulated switch for modulating and controlling the energy supplied from said d-c input to said transformer, an output rectifier-filter combination for supplying a d-c output, and pulse generating circuits for supplying pulse width modulated pulses to said switch whereby said d-c output can be fed to said pulse generating circuits to said d-c output, a starting circuit, for initiating operation of said power supply when it is energized, comprising:
an isolated capacitor of sufficient size to store sufficient energy to power said pulse generating circuits during a start interval;
a winding on said transformer and a series connected rectifier coupled for developing a nominal charge voltage on said isolated capacitor;
means for coupling said pulse generating circuits to be energized by said nominal charge voltage;
a first resistor coupled between said d-c input and said capacitor and having a value high enough to be incapable of operating said pulse generating circuits, said first resistor being low enough in value to charge said capacitor when said pulse generating circuits are inoperative;
a plurality of zener diodes coupled in series across said isolated capacitor with the combined zener voltage of said plurality substantially exceeding said nominal charge voltage while being a fraction of said d-c input whereby a zener current will flow when said charge on said isolated capacitor exceeds said combined zener voltage; and
means responsive to the onset of said zener current for starting said pulse generating circuits.

4,497,018
SERIES INVERTER FOR CAPACITOR CHARGING

Benjamin M. Rice, Natick, Mass., assignor to Candela Corporation, Natick, Mass.

Filed May 5, 1983, Ser. No. 491,983
Int. Cl.[3] H02M 7/515
U.S. Cl. 363—96 10 Claims



1. A series inverter circuit having electronic switches connected in a push-pull configuration between a dc supply and a common load circuit and a series capacitor in the common load circuit, the series inverter circuit comprising means for discharging the series capacitor through the load prior to a first cycle of current flow from the dc supply.

4,497,019
PROGRAMMABLE CONTROL SYSTEM FOR CONTROLLING AT LEAST TWO PARAMETERS IN A PREDETERMINED SEQUENCE USING BOTH ANALOG AND DIGITAL CONTROL SIGNALS

Glenn R. Waber, St. Paul, Minn., assignor to GNB Batteries Inc., Mendota Heights, Minn.

Continuation-in-part of Ser. No. 245,772, Mar. 20, 1981,. This application May 17, 1982, Ser. No. 378,958
Int. Cl.[3] G06F 15/16; G05B 19/417
U.S. Cl. 364—132 14 Claims

1. An apparatus for controlling a work function requiring the control of at least two parameters in a predetermined sequence which comprises:

(a) at least one work station having means for carrying out said work function;

(b) a slave control means for controlling the work function at said work station in a predetermined sequence;

(c) at least one interface means electronically connected to said slave control means for receiving and storing information for a first parameter of said work function, said interface means preventing transmission of said parameter information to said slave control means until being probed by said slave control means;

(d) a master control means electronically connected to said interface means to transmit said first parameter information to said interface means; said master control means being further electronically connected to said slave control means to cause said slave control means to probe said interface means and receive said first parameter information from said interface means; said slave control means controlling said work function in said predetermined sequence upon receiving said first parameter information;

(e) means for storing information for a second parameter of said work function, said master control means being further electronically connected to said slave control means to allow transmission of said information for a second work function parameter via a signal distinguishable from the first parameter information;

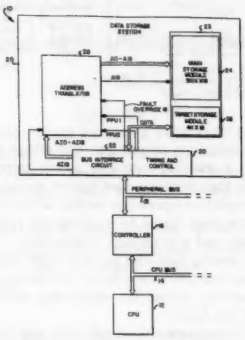
(f) said master control means comprising a microprocessor-based programmable control and said slave control means comprising a microprocessor portion and a control portion; and

(g) said first parameter information is received by said microprocessor portion of said slave control means and said second parameter information is received by said control portion of said slave control means.

4,497,020
SELECTIVE MAPPING SYSTEM AND METHOD

Thomas J. Gilligan, Rolling Hills Estates, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jun. 30, 1981, Ser. No. 279,204
Int. Cl.[3] G06F 9/30
U.S. Cl. 364—200 28 Claims



1. The method of mapping a subset of elements of a first set of elements into a second set of elements comprising the steps of:

assigning to each element within the first set a different multidigit encoded state from a first set of multidigit encoded states wherein each encoded state is represented by a different combination of multistate digits;

assigning to each element within the second set a different multidigit encoded state from a second set of multidigit encoded states wherein each encoded state is represented by a different combination of multistate digits;

grouping the digits representing the first set of encoded states into a plurality of groups with each group having at least one digit of the digits representing the first set of encoded states and with all of the digits of any given group being mutually exclusive of the digits of any other group, each group of at least one digit having a plurality of different definable group states defined by different combinations of the states of the at least one digit in the group;

storing for each given element of the subset the encoded state from the second set of encoded states assigned to the element of the second set of elements to which the given element is to be mapped, with each digit of the stored encoded state from the second set of encoded states being stored in association with a state of a group, the group state being defined by the state of each of the at least one digit in the group for the encoded state from the first set of encoded states assigned to the given element of the subset;

detecting the occurrence of a multidigit encoded state assigned to an element within the subset; and

retrieving the digits representing the encoded state from the

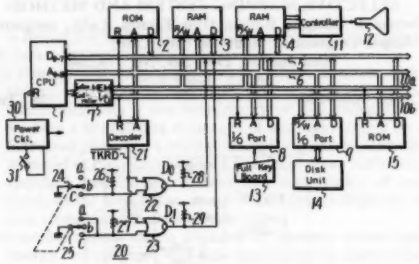
second set of encoded states stored in association with the group states defined by the digits of the detected multi-digit encoded state.

4,497,021

MICROCOMPUTER SYSTEM OPERATING IN MULTIPLE MODES

Joji Fukuda, Yokohama, and Yutaka Yamashiki, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,857
Claims priority, application Japan, Jun. 26, 1981, 56-99868
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **14 Claims**



1. A mode selecting circuit for use with a microcomputer system having a central processing means responsive to mode control signals for operating said system in accordance with a plurality of respective operating modes, a power supply circuit for supplying a reset signal to said central processing means, memory means, and a keyboard, comprising;

gate means having first and second input means and output means, said output means being connected with said central processing means for supplying said mode control signals to the latter;

selector switch means connected with said first input means and being operable for selectively determining which of said mode control signals is supplied from said gate means to said central processing means for achieving the respective operating mode; and

sensing means connected to said second input means of said gate means for supplying from said gate means one of said mode control signals characteristic of one of said operating modes when said reset signal is supplied to said central processing means simultaneously with actuation of said keyboard irrespective of said selector switch means.

4,497,022

METHOD AND APPARATUS FOR MEASUREMENTS OF CHANNEL OPERATION

Roger L. Cormier, Pleasant Valley; Robert J. Dugan, Hyde Park; Richard R. Guyette, Hopewell Junction; Ronald L. Hankison, Poughkeepsie; Ming C. Hao, Chappaqua; Arthur L. Levin, Pleasant Valley, all of N.Y.; George A. McClain, Delray Beach, Fla.; Paul J. Wanish, and Carl Zeitler, Jr., both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

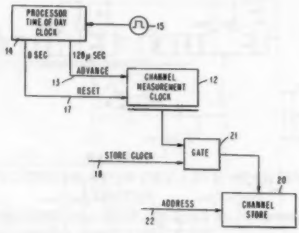
Filed Oct. 19, 1982, Ser. No. 435,192
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **11 Claims**

1. A channel measuring system comprising,

a central processor having a time of day clock, a channel having a channel clock, means connecting a stage of the central processor time of day clock to increment the channel clock at intervals defining the resolution of the measuring system, and means connecting a stage of the central processor time of day clock to reset the channel clock at intervals corresponding to the longest channel operation to be monitored, whereby after an initial reset operation the channel clock is comparable with corresponding stages of the central processor time of day clock,

means in the central processor for starting a channel operation including means for storing the value of the system time of day clock in a predetermined location,

means in the channel for accessing the channel clock at a predetermined point in said channel operation, and



means in the channel for subtracting the stored value of the central processor time of day clock and the channel clock and calculating the time interval from the time when the central processor starts the channel operation to the time when the channel reaches the predetermined points in its operation,

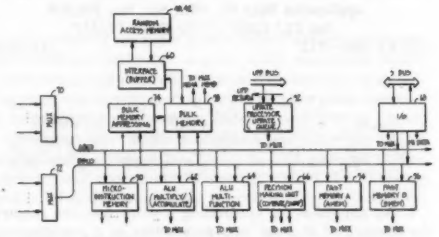
whereby channel measurements operations are performed.

4,497,023

LINKED LIST OF TIMED AND UNTIMED COMMANDS

James A. Moorer, San Rafael, Calif., assignor to Lucasfilm Ltd., San Rafael, Calif.

Filed Nov. 4, 1982, Ser. No. 439,125
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **8 Claims**



1. In a digital processor that receives timed and untimed commands, apparatus for storing and ordering the commands for execution by the processor comprising:

means for storing the said commands in a linked list,

means for inserting timed commands in the list, and

means for inserting untimed commands in locations in the list that are in order for execution before the timed commands.

4,497,024

NUCLEAR IMAGE DISPLAY CONTROLLER

David A. Roth, Dousman, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 1, 1981, Ser. No. 280,713
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 **4 Claims**

1. Apparatus for imaging anatomy that has been infused with a radiation photon emitting radioisotope, comprising:

camera means including a planar scintillation crystal for

being arranged over the anatomy to produce scintillations in response to absorption of photons emitted from said anatomy to the crystal during predetermined intervals,

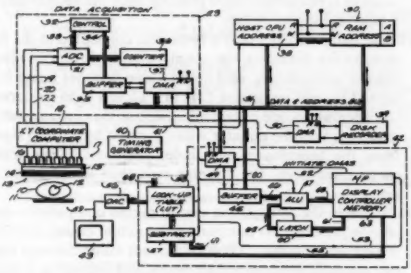
an array of detectors arranged on a side of said crystal opposite of the side on which the photons enter, said detectors producing electric signals corresponding to the scintillations,

computer means having input and output means, the input means coupled to said detectors for receiving said signals, said computer means using said signals to generate analog signals corresponding in amplitude to the x and y coordinates of each scintillation,

an analog-to-digital converter (ADC) having input and output means, the input means coupled to the output means of the computer means for receiving said analog coordinate signals, said ADC converting said analog signals to digital values representative of the x and y coordinates of the scintillations,

addressable digital memory means having a plurality of storage locations, said digital x and y coordinate values corresponding to each detected scintillation constituting an address to a storage location, said locations corresponding, respectively, to picture elements (pixels) that compose an image frame, said locations storing digital numbers representative of the intensities of the pixels,

a central processor unit (CPU), control means including means for incrementing digital numbers and bus means interconnecting said CPU, digital memory means, address output means of said ADC and said control means,



each time a location in said digital memory means is addressed said CPU uses said address to effect transfer of the digital pixel intensity number stored in said location to said control means for being incremented by one and returned to the same location in said memory means,

a display controller including a digital memory, said memory having input and output means,

an arithmetic logic unit (ALU) having a plurality of input means and having output means, the output means being coupled to the input means of the display controller memory,

buffer means having input means coupled to said bus means and having output means coupled to an input means of said ALU,

latch means having input and output means, the input means connected to said output means of said display controller memory and the output means connected to an input means of said ALU,

a first direct memory access (DMA) controller operative to periodically cause transfer of the digital pixel intensity representative numbers for an image frame from the first mentioned memory through said buffer means to one input of said ALU while corresponding pixel intensity representative numbers for frames previously transferred to said ALU are being fed back from said output means of the display controller memory through said latch to the other input of said ALU to thereby add or subtract the pixel values for successive images when said ALU is set to add or subtract, respectively,

a digital number subtractor having input and output means, the input means being connected to an output means of said display controller memory, said subtractor subtracting the same digital number from the digital pixel intensity representative numbers supplied from said display controller memory to thereby reduce the level of all of said numbers proportionately,

a look-up table (LUT) comprised of a random access memory (RAM) having locations corresponding to the locations of the pixels, said RAM having output means and having address input means connected to the output means of said subtractor, said LUT having been previously loaded with a translation table for determining the slope of the brightness versus pixel number relationship for the numbers resulting from the subtraction, said numbers constituting addresses to said LUT locations, addressing any location resulting in a digital signal representative of pixel brightness appearing at the output means of said RAM,

a digital-to-analog converter coupled to the output means of said RAM for converting said signals to analog video signals, and

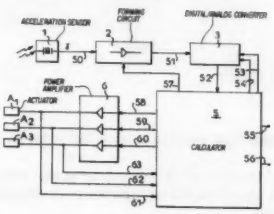
television means for displaying an image represented by said video signals.

4,497,025

PROCEDURE AND SYSTEM FOR DETECTING COLLISIONS AND CONTROLLING SAFETY

Gilles Hannoyer, Saint-Germain En-Laye, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Apr. 9, 1982, Ser. No. 367,087
Claims priority, application France, Apr. 28, 1981, 81 08424
Int. Cl.³ B60R *21/08*
U.S. Cl. 364—424 **5 Claims**



1. A method of detecting collisions and controlling safety devices for vehicle passengers in which the vehicle decelerations are continuously measured and in which the measured signals are converted into a numerical signal which represents the deceleration of the vehicle with said numerical signal being processed and compared with predetermined values so that the release of the safety devices is controlled as a function of the result of the comparison, comprising the following steps carried out in cycles with each cycle having a constant duration:

calculating a weighted acceleration value based upon said numerical deceleration value for a first cycle and at least one of three constants;

producing an mean value of the weighted acceleration value;

comparing said mean value with at least a first and a second predetermined value;

choosing one of said constants to calculate the weighted acceleration value during the following cycle as a function of the result of said comparison;

calculating a correcting term value each time said mean value exceeds successively said first predetermined value and said second predetermined value wherein said cor-

recting term value is a function of the time between the successive excessions of said two predetermined values;

retaining said calculated correcting term value as said correcting term as long as said mean value is greater than or equal to said first predetermined value but is less than the value of said second predetermined value;

assigning to said correcting term a value of zero when said mean value decreases below said first predetermined value;

calculating an algorithm having a value equal to the sum of said mean value and said correcting term;

comparing said algorithm value to at least one threshold value; and

releasing at least one of said safety devices when said algorithm value is greater than or equal to said at least one threshold value.

4,497,026

ANTI-WHEEL-LOCK CONTROL SYSTEM

Volker Braschel, Heilbronn; Reiner Emig, Oftersheim; Heinz Leiber, Oberriexingen; Michael Mendel, Heidelberg, and Jürgen Gerstenmeier, Neckargemünd-Waldhilsbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

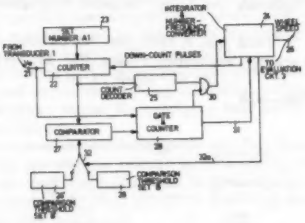
PCT No. PCT/DE81/00187, § 371 Date Aug. 18, 1982, § 102(e) Date Aug. 18, 1982, PCT Pub. No. WO82/02862, PCT Pub. Date Sep. 2, 1982

PCT Filed Nov. 4, 1981, Ser. No. 414,348

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107115

Int. Cl.³ B60T *8/10*

U.S. Cl. 364—426 **8 Claims**



1. An anti-wheel-lock control system for vehicles comprising

a wheel speed transducer (**1**) providing actual wheel speed signals, and, upon oscillating operation of wheels, disturbance signals;

an evaluation circuit (**3**) coupled to the speed transducer and receiving signals therefrom, and generating control signals;

devices (**4, 5**) coupled to the evaluation circuit for varying braking pressure;

and a network to recognize disturbance signals occurring due to frictional oscillations of the wheels and inhibiting said disturbance signals from affecting operation of the evaluation circuit (**3**) comprising

means (**16***a*, b_{max}; **28**, B, **28'**, B') for setting a simulation signal which has a range corresponding to a change in wheel speed which is physically impossible;

recognition circuit means (**15–17**; **22, 27, 29**) comparing the wheel speed signals with the simulation signals and providing an output if the wheel speed signals include disturbance signals which represent physically impossible conditions in the system and hence are within the range of the simulation signals;

a memory (**18**; **24**) including an integrator continuously storing wheel speed signals as received from the transducer and providing auxiliary wheel speed signals;

and an auxiliary device (**13, 17**; **30**) connected to and controlled by said recognition circuit means and inhibiting application of signals from the transducer (**1**) to the evaluation circuit and, instead, connecting the storage means to the evaluation circuit to provide auxiliary wheel speed signals for the control devices (**4, 5**) from wheel speed measured prior to appearance of the disturbance in the signals derived from the transducer (**1**); and wherein, for digital processing of signals in the system,

the transducer (**1**) provides output signals in pulse form;

a first counter (**22**) is provided;

means (**23**) for setting the first counter to a predetermined count value comprising

a number entering means (**23**) which sets said first counter (**22**) to a predetermined count value, said first counter counting down from said predetermined count value;

control means (**24**) coupled to the counter and changing the count value therein at a rate representative of the count number set into the counter upon occurrence of a preceding pulse from the transducer, so that the count number counted by the counter, upon no change in wheel speed, will be unvarying, the

counter control means including said integrator (**24**) and a number-frequency converter to provide numbered pulses to said first counter (**22**) and to control the counting state of said first counter,

said integrator controlling the first counter to count down at a frequency which is in proportion with a previously measured speed value as counted by said counter and controlled by said integrator (**24**),

the pulses from the integrator so controlling the first counter (**22**) that, when wheel speed is unvarying, said first counter is placed into zero position until the appearance of a next transducer pulse;

a count value decoder (**25**) is provided, connected to the first counter for decoding the count value deviation (A) from zero of said counter, said count value decoder being connected to said integrator (**24**) in a closed loop to correct the integration rate of said integrator so that, upon a subsequent cycle of the counter when trigered by a speed signal from the transducer, and under then unvarying wheel speed conditions, the counter will then again count to zero;

and wherein the recognition circuit means comprises a digital comparator (**27**) comparing the actual count state (A) of said first counter (**22**) with a count value derived from said simulation signal setting means and providing a count state representative of a physically impossible condition in the system,

said comparator providing an output signal representative of the comparison of the number (A) in the counter and the threshold (B, B') supplied thereto by said simulation signal setting means; and wherein

a gate circuit (**29, 30**), forming said auxiliary device, is provided, coupled to said count decoder (**25**) and the integrator (**24**) and rendering change in the integrator ineffective if the count state in the first counter (**22**) exceeds said threshold (B) applied thereto by the simulation signal generating means (**28**), the integrator thereby maintaining the wheel speed signal as an auxiliary stored wheel speed signal representative of prior wheel speed.

4,497,027

METHOD AND APPARATUS FOR AUTOMATIC WARP PREVENTION OF CORRUGATED BOARD

Richard McGuire, Danbury, Conn., and Herbert M. Donhowe, Rogers, Ark., assignors to Textrix Corporation, Danbury, Conn. and Corrugated Industry Development Corp., Milwaukee, Wis.

Filed Jun. 14, 1982, Ser. No. 388,468

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—471 **77 Claims**

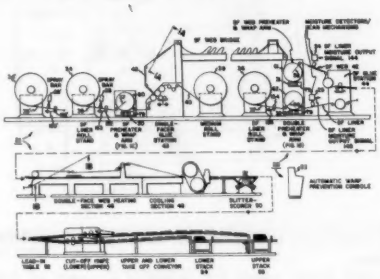
1. An automatic warp prevention apparatus for use with a corrugator machine for fabricating corrugated board from at

least a single-face liner, a medium, and a double-face liner, the corrugator machine including separate means responsive to at least a received adjusting signal, for adjusting the overall moisture content of at least the single-face liner and double-face liner, comprising:

(A) means for sensing the moisture content of the double-face liner across the liner's width so as to obtain a plurality of readings;

(B) means for sensing the moisture content of the single-face liner across the liner's width so as to obtain a plurality of readings; and

(C) means for processing the sensed double-face liner and single-face liner moisture readings, including



(1) averaging the double-face liner readings,

(2) averaging the single-face liner readings,

(3) determining the average moisture difference between the reading average of the double-face liner and single-face liner, and

(4) if the average moisture content difference is outside of a predetermined band about a desired average moisture offset, said desired average moisture offset having any positive,. negative or zero value and said band having any positive, negative or zero value, then generating the adjusting signal with a magnitude proportional to the amount the average moisture content difference is different from the desired average moisture offset.

4,497,028

NUMERICAL CONTROL SYSTEM

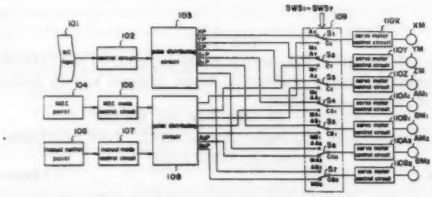
Ryoichiro Nozawa, Tokyo, and Hideaki Kawamura, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Sep. 25, 1981, Ser. No. 305,787

Claims priority, application Japan, Sep. 30, 1980, 55-136609

Int. Cl.[3] G05B *7/00*; G05D *3/04*; D05B *21/00*

U.S. Cl. 364—474 **6 Claims**



1. A numerical control method for a machine tool having a plurality of controlled axes of movement, each axis having a manual operation mode, a manual data input mode and an automatic operation mode, which method comprises the steps of:

operating at least some of the controlled axes of the machine tool in a mode other than said automatic operation mode, and

executing simultaneously, machining work along some of said controlled axes in the automatic operation mode, and another task along at least some of the remaining controlled axes, in a mode other than said automatic operation mode.

2. A numerical control appartus, having automatic control circuitry for providing automatic control pulses and manual control circuitry for providing manual control pulses, for controlling a machine tool having a plurality of axes controlled by respective servo control circuits each having an input terminal for selectively receiving one of manual control pulses and automatic control pulses, each axis having a manual operation mode, a manual data input mode and an automatic operation mode, said apparatus comprises:

switching means responsive to a changeover signal for selectively connecting the input terminals of the servo control circuits to receive one of the automatic control pulse and the manual control pulse, wherein the servo control circuits for the axes to be controlled in an automatic operation mode are connected to the automatic control circuitry, and the remaining servo control circuits are connected to the manual control circuitry, and

executing means operatively connected to said switching means, for providing said changeover signal, and for simultaneously executing machining work in the automatic operation mode, and executing another task in a mode other than the automatic operation mode.

4,497,029

NUMERICAL CONTROL DEVICE

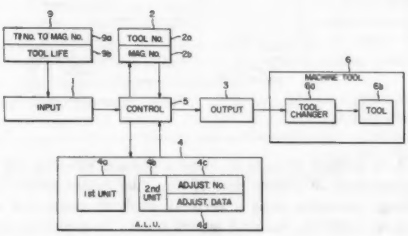
Morio Kiyokawa, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,607

Claims priority, application Japan, Apr. 15, 1981, 56-56779

Int. Cl.[3] G06F *15/46*

U.S. Cl. 364—474 **16 Claims**



1. A numerical control device comprising:

an input means for inputting a tool select command for commanding a selection of a tool to be used in a machining process from a plurality of tools each mounted at a corresponding magazine location;

a tool number register means for storing said tool select command as a tool number;

a tool-number-to-magazine-number register means for registering tool numbers correlated with corresponding magazine numbers, each of the magazine numbers corresponding to a magazine location;

a tool life register means for storing tool lives correlated with the corresponding magazine numbers;

a first calculator means for determining a magazine number of a magazine location at which a usable tool having a remaining life is mounted in response to a tool number stored in said tool number register means and in response to the contents of said tool-number-to-magazine-number register means and said tool life register means;

a magazine number register means for storing said magazine number determined by said fisrt calculator means;

an adjustment number register means for registering tool

adjustment numbers correlated with the coresponding magazine numbers;

an adjustment data register means for registering tool adjustment values correlated with the corresponding adjustment numbers;

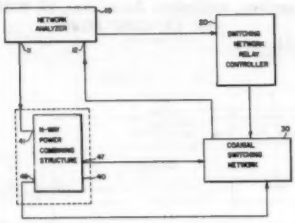
a second calculator means for calculating a tool adjustment value in response to the magazine number stored in said magazine number register means and in response to the contents of said adjustment number register means and the adjustment data register means; and

output means for outputting said magazine number stored in said magazine number register means and said tool adjustment value calculated by said second calculator means.

4,497,030
N-WAY SUMMING NETWORK CHARACTERIZATION SYSTEM

Donald R. Bowling; Darry M. Kinman; Marko Afendykiw, all of Ridgecrest, and David J. White, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 20, 1981, Ser. No. 255,621
Int. Cl.³ G01S 7/02
U.S. Cl. 364—481 **7 Claims**



1. A method of quasi real-time computer aided tuning and optimization of symmetrical N-way microwave power combining structures using a network analyzer connected to a coaxial switching network which selects transmission routes through said combining structure, comprising the steps of:

providing said analyzer with a data base for said combining structure including at least;

a constant (N) dependent on the number of input ports in said combining structure;

a constant (Zo) which is the characteristic impedance of said network analyzer;

limiting the number of input ports of said combining structure available for signal transmission;

inputting a test signal from said network analyzer to one of the open input ports of said combining structure;

measuring the scattering parameters of said power combining structure at various RF frequencies utilizing various transmission paths through said power combining structure;

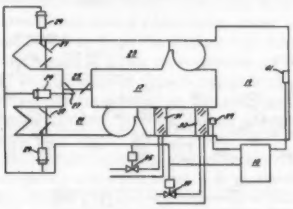
calculating in said analyzer the maximum potential combining efficiency, η, and the input impedance of the ith port under conditions of maximum combining efficiency, Zic, at each RF frequency desired; and

outputting said efficiency, η, and impedance, Zic, for each RF frequency in tangible form for use by an operator in aligning said power combining structure for optimum performance.

4,497,031
DIRECT DIGITAL CONTROL APPARATUS FOR AUTOMATED MONITORING AND CONTROL OF BUILDING SYSTEMS

Paul H. Froehling, Franklin; Jude R. Anders, Glendale; Lawrence J. Strojny, Muskego, and James M. Rehberger, Caledonia, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jul. 26, 1982, Ser. No. 401,632
Int. Cl.³ G06F 15/20
U.S. Cl. 364—505 **40 Claims**



1. A low level microprocessor based system controller comprising:

power supply means for providing a source of regulated electrical power to the controller;

field programmable processor means for transferring selected data base information to and receiving status signals from an interface means, digitally executing algorithms respecting said status signals in accordance with computer program routines selected from a library of mnemonically identified routines residing in the read-only memory portion of the processor means and responsively directing programmed data and digital command signals to said interface means;

interface means for periodically updating the data base of said processor means, analyzing and conditioning signals received from said processor means and from remote data points, and for selectively controlling said remote data points, and;

operator panel means having information display means, said operator panel means cooperating with said processor means for displaying and adjusting selected system operating parameters and variables.

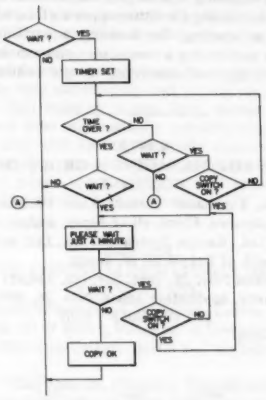
4,497,032
VOCAL INDICATING DEVICE OF COPYING MACHINE

Tatsuoki Shinohara, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,588
Claims priority, application Japan, Jul. 22, 1981, 56-113639
Int. Cl.³ G10L 1/00
U.S. Cl. 364—513.5 **4 Claims**

1. A vocal indicating device for a copying apparatus including a power switch and a copy start switch, comprising means for detecting an operating condition of parts of said apparatus, said detecting means outputting signals indicative of a waiting mode or a ready mode of said copying apparatus, voice output control means, and control means receiving said signals outputted from said detecting means for controlling the operation of said voice output control means, said control means including timer means set to a predetermined time upon detection of both an operation of said power switch and signals indicative

of said waiting mode and actuating said voice output control means at the end of said predetermined time to output a wait



indication when said waiting mode continues over said predetermined time.

4,497,033

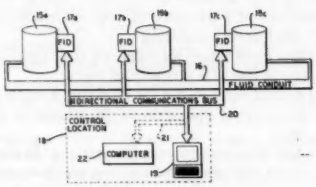
MULTIPLEXED ARRANGEMENT FOR CONNECTING A PLURALITY OF TRANSDUCERS TO A FIELD INTERFACE DEVICE AT A STORAGE TANK

Rafael Hernandez, Jimenez, Mexico; Edmund E. Chow, Lilburn, Ga.; Marion L. Moncrief, Jr., and Frank S. Glass, both of Stone Mountain, Ga., assignors to Process Technologies, Inc., Tucker, Ga.

Division of Ser. No. 200,382, Oct. 24, 1980, Pat. No. 4,387,434. This application Sep. 22, 1982, Ser. No. 421,142

Int. Cl.[3] **G01F** *23/26;* **G06F** *15/00*

U.S. Cl. 364—551 **1 Claim**



1. In a tank in a fluid storage facility including a plurality of transducers spaced vertically in said tank and means responsive to the fluid level in said tank for providing an electrical level signal, the improvement of:

an addressable electronic multiplexer connected to said plurality of transducers for connecting an output signal of a first particular one of said plurality of transducers to a controller in response to said controller providing a first discrete address to said multiplexer, said address being determined by said electrical level signal;

said controller including memory means for defining a predetermined range of valid values of said output signal which correspond to an expected range of values for said output signal when said first particular one of said plurality of transducers is operating properly;

said controller further comprising testing means responsive to said memory means for providing a second particular discrete address to said multiplexer in response to said output signal of said first particular transducer having a value outside said predetermined range of valid values.

4,497,034

HEADING DETECTING APPARATUS

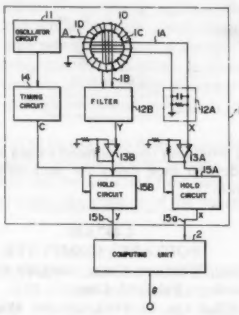
Akira Kuno, Oobu; Muneaki Matsumoto, Okazaki, and Koji Numata, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 8, 1982, Ser. No. 355,622

Claims priority, application Japan, Aug. 5, 1981, 56-123370; Aug. 8, 1981, 56-124432; Aug. 24, 1981, 56-133090

Int. Cl.[3] **G01P** *21/00*

U.S. Cl. 364—571 **9 Claims**



1. A heading detecting apparatus attached to a moving object and including a geomagnetic field sensor for detecting the direction of the earth's magnetic field in terms of two orthogonal components and a computing circuit responsive to orthogonal first and second electric signals from said geomagnetic field sensor to compute a heading of said moving object and generate a heading signal, wherein said computing circuit comprises:

means whereby when one of first and second output values (X', Y') respectively proportional to said orthogonal first and second electric signals (X, Y) attains a predetermined value, one of first and second offset values (X offset, Y offset) for the other of said first and second output values is repeatedly computed and stored; and

means for repeatedly during operation of said apparatus correcting said electric signals from said geomagnetic field sensor in accordance with said offset values to derive said first and second output values for computing the heading signal of said moving object therefrom.

4,497,035

METHOD OF GENERATING TIME DELAY

Shigeru Yabuuchi, Tokyo; Takeyuki Endoh, Kodaira; Kazuyuki Kodama, Hachioji, and Jushi Ide, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,292

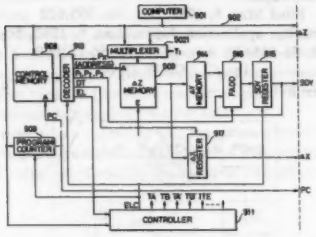
Claims priority, application Japan, Jan. 16, 1981, 56-3790

Int. Cl.[3] **G06F** *15/32;* **G06J** *1/02*

U.S. Cl. 364—577 **8 Claims**

1. A method of generating a signal with a time delay in response to and in correspondence with an input signal, comprising the first step of sampling said input signal at a predetermined sampling frequency providing a sampling interval equal to an integral number of times (the integer being at least 2) the cycle time of an operation cycle, evaluating at each sampling point the variation of said input signal during a sampling interval between each particular sampling point and the previously adjacent sampling point, and storing such variations successively into a first memory; the second step of successively reading out from said first memory for each current sampling interval the variation in a sampling interval which precedes the current sampling interval by a predetermined number of sampling intervals according to the desired time delay; and the third step of generating a value of said input signal for each

operation cycle for each of said preceding sampling intervals by an interpolation operation based on the variation read out from said first memory, said cycle time and said sampling



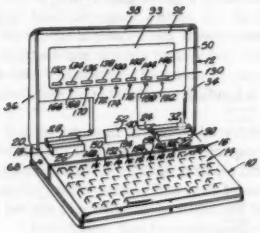
interval, and providing the generated values as an output signal having the desired time delay for said input signal of each operation cycle.

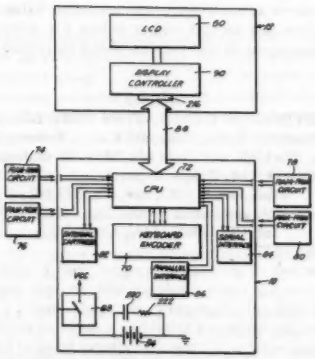
4,497,036

PORTABLE COMPUTER

James P. Dunn, Westport, Conn., assignor to Microffice Systems Technology, Fairfield, Conn.

Filed Apr. 12, 1983, Ser. No. 484,319
Int. Cl.[3] G06F *7/00*
U.S. Cl. 364—708 **32 Claims**





1. A computer, comprising:

a central processing unit;

a keyboard coupled to said central processing unit and including a plurality of entry keys for entering a full alphabet and ten digits;

a display arrangement coupled to said central processing unit and including a liquid crystal display;

a case having a base with an upper surface and an edge, and a cover hinged to said base at the edge and having an inner surface facing said base when closed and exposed to a viewer when opened;

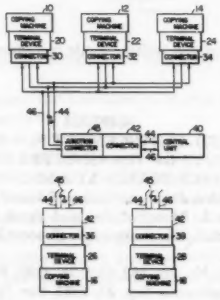
said base housing said central processing unit and said keyboard and exposing said keyboard for operation by a user when the cover is open and said cover housing said display and exposing said display on the inner surface when open and covering the entire upper surface when said case having an opening for forming a cartridge receiving chamber and having a connector connectable to circuitry in a cartridge and connected to said central processing unit.

4,497,037

APPARATUS FOR MANAGING A GROUP OF COPYING MACHINES

Takaaki Kato, Toyohashi; Takeshi Kato, Funabashi, and Yoshikazu Yoshizawa, Ebina, all of Japan, assignors to Nippondenso Co., Ltd., Kariya; Systemkiki Co., Ltd. and Fuji Xerox Co., Ltd., both of Tokyo, all of, Japan

Filed Nov. 25, 1981, Ser. No. 324,951
Claims priority, application Japan, Nov. 26, 1980, 55-166179
Int. Cl.[3] G06F *15/20*
U.S. Cl. 364—900 **1 Claim**



1. An apparatus for managing a plurality of copying machines comprising:

a plurality of terminal devices each operatively associated with one of a plurality of copying machines, each said terminal device including

(a) first input means for receiving code signals each indicative of one of a plurality of users,

(b) second input means for receiving a signal indicative of the copying operation of its associated copying machine,

(c) data processing means for enabling the copying operation of said associated copying machine upon receipt of said code signals and including terminal data memory means having a plurality of distinguishable storage locations for each of said users, whereby said signal indicative of the copying operation received by said second input means is cumulatively stored in corresponding storage locations of said terminal data memory means specified by said code signals received by said first input means, and

(d) first communication means provided in the terminal device for data transmission from and to said data processing means; and

a central unit directly connected to each of said plurality of terminal devices through transmission lines, said central unit including

(e) second communication means provided in the central unit for data transmission from and to each said first communication means of said terminal devices,

(f) central data processing means for controlling data transmission to and from said terminal devices and including central data memory means having a plurality of distinguishable storage locations for each of said plurality of users, whereby data cumulatively stored in

each of said terminal data memory means and transmitted through said first and second communication means are summed up separately for each of said users and stored in corresponding storage locations of said central data memory means specified by said code signals, and

(g) manually operable means for generating first and second commands,

said central data processing means being operative to effectuate the data summing-up and storing operation of said central data memory means upon receipt of said first command from said manually operable means and operative to erase said data cumulatively stored in each of the corresponding storage locations of all said terminal data memory means upon receipt of said second command from said manually operable means.

4,497,038
ELECTRONIC CONTROLLER HAVING A DETACHABLE FRONT PANEL

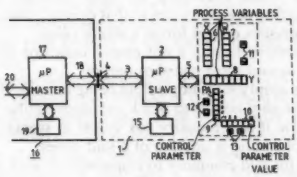
Rudolf Diepold-Scharnitzky; Wolfgang Lesche, and Volker Rindfleisch, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,102

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3122037

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—900 **4 Claims**



1. In an electronic controller for controlling an external process, the controller being of the type having a main housing for control circuitry for controlling at least one of a plurality of process variables and at least one of a plurality of control parameters associated with the process, a front panel unit on which are arranged means for incrementally changing a value of at least one process variable controlled by the controller in discrete magnitude steps, means for selecting a control parameter controlled by the electronic controller, means for incrementally changing a value of the selected control parameter in discrete magnitude steps, means for indicating the value of the process variable, means for indicating the selected control parameter and means for indicating the value of the selected control parameter, the improvement comprising:

means for electrically detachably connecting the front panel unit from said main housing of the electronic controller;

means for mechanically detachably connecting the front panel unit from said main housing of the electronic controller;

a master microprocessor included in said control circuitry contained in said main housing for controlling the process, said master microprocessor receiving inputs associated with said at least one process variable and said control parameters from said controlled process and transmitting outputs associated with said at least one process variable and said control parameters to said controlled process; and

a slave microprocessor contained in said front panel unit and permanently electrically coupled to said means for selecting a control parameter, said means for incrementally changing a value of the selected control parameter, said means for incrementally changing a value of the at least one process variable, said means for indicating the selected control parameter, said means for indicating the value of the at least one process variable and said means for indicating the value of the selected control parameter, said slave microprocessor coupled to said master microprocessor in said main housing through said means for electrically detachably connecting and said means for mechanically detachably connecting, said slave microprocessor being responsive to signals received from said master microprocessor via said means for electrically detachably connecting for updating values of said at least one process variable and said control parameters and transmitting signals to said master microprocessor via said means for electrically detachably connecting for changing the value of said selected control parameter and said at least one process variable in response to actuation of said respective means for incrementally changing the value of said selected control parameter and said at least one process variable;

said control circuitry in said main housing comprising means for independently controlling the process whereby said front panel unit may be detached from said main housing without interrupting the control of the process.

4,497,039
JOIN OPERATION PROCESSING SYSTEM IN RELATIONAL MODEL

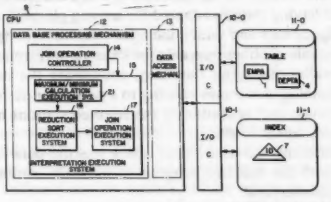
Hazime Kitakami, Yokohama; Hiroshi Ishikawa, Tokyo; Masayoshi Tezuka; Susumu Adachi, both of Kawasaki, and Akifumi Makinouchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1982, Ser. No. 393,558

Claims priority, application Japan, Jun. 30, 1981, 56-101490

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—900 **6 Claims**



1. A join operation processing system responsive to user instructions for performing join operations in a relational model in a data processing system where a data base storing a plurality of data tables, each data table comprising a plurality of information fields with a plurality of data entries within each field, further storing pertinent index tables arranged such that entries in each index table are in an ascending or descending sequence, the entries in the index table corresponding to the data entries in an information field in one or plurality of said data tables and storing dictionary information for each table defining the information fields, and processings are executed by providing a data base processing mechanism and using said tables of said data base, said data base processing mechanism at least comprising:

maximum/minimum calculation execution means for preliminarily judging a tuple extraction range for a join field in a join object table based on a join predicate described by users and the dictionary information for the index table which can be utilized for said join processing;

reduction sort execution means for sorting one of unsorted tables or one of the tables which cannot use the index tables based on the preliminary judged tuple extraction range and for executing the sorting for a succeeding table based on the extraction range limited by the sorting by said reduction sort execution means; and

join calculation execution means for executing join process-

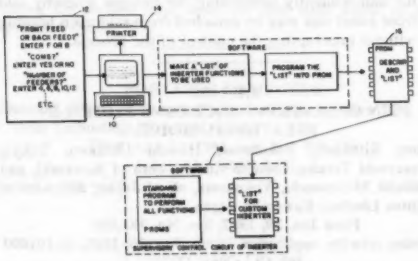
ing by extracting the join object tuple for the join object table based on the extraction range for the index table for the table which can use the index and the extraction range of the table sorted by said reduction sort execution means, whereby the processing instructed by users is executed on the basis of the limited relationship defined by the join object table.

4,497,040

METHOD AND APPARATUS FOR CUSTOMIZING A MULTI-STATION DOCUMENT-INSERTER

John M. Gomes, Bridgeport, and Peter N. Piotroski, New Canaan, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 1, 1982, Ser. No. 394,385
Int. Cl.³ G06F *9/22*
U.S. Cl. 364—900 **10 Claims**



1. A method for customizing a multi-station document inserter having stations adapted for use in a plurality of selectable configurations and which includes a standard program having executable routines operable for causing performance of all of a plurality of inserter functions, comprising the steps of:

obtaining user inputs relating to a particular desired configuration and operation of the selected stations multi-station document inserter;

translating the user inputs into a specific data table for use with the standard program in the multi-station document inserter; and

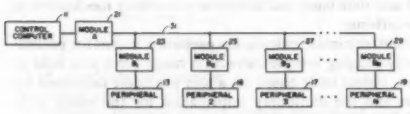
incorporating the specific data table into the multi-station document inserter for selecting those particular executable routines of the standard program to be used to provide a multi-station document inserter which is customized to accomplish particular user requirements.

4,497,041

PARALLEL SERIAL CONTROLLER

Leon Braun, Hollywood, Fla., assignor to Sebrn Corporation, Miami, Fla.

Filed Sep. 9, 1982, Ser. No. 416,177
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—900 **3 Claims**



1. An interface between a peripheral output and a computer, where the peripheral outputs data in the form of a series of n-bit words with corresponding strobe pulses and certain of the said n-bit words are to be masked and where said interface comprises,

(a) an n-bit word D flip-flop connected to said peripheral output thereby receiving said n-bit words at an input thereof;

(b) a first one-shot means, said first one-shot means being triggered by said strobe pulses to deliver a first one-shot output, said first one-shot output activating said D flip-flop to generate a D flip-flop output after a time delay sufficiently long to have said n-bit peripheral output word set up on said D flip-flop inputs;

(c) an n-bit word first-in/first-out memory, said memory connected to said D flip-flop output to receive said output as a memory input;

(d) a hardware mask for detecting said certain of said n-bit words which are to be disregarded, said mask being connected to said D flip-flop so that the output thereof becomes the mask input;

(e) logic means preselected in said mask to differentiate such n-bit words as are desired and those to be disregarded;

(f) said mask having a mask output that is preselected to desired or to be disregarded n-bit words;

(g) a second one-shot means triggered by said strobe pulses to deliver a second one-shot output, said second one-shot output being combined with said mask output and triggering said memory to store the n-bit word on said memory input if and only if said mask output indicates that said n-bit word on said memory input is not one of said certain n-bit words to be disregarded thereby storing a series of n-bit words;

(h) a third one-shot triggered by said strobe pulses to deliver a third one shot output, said third one-shot output having a pulse width exceeding the time between successive strobe pulses in a said series so that during a said series said third one-shot output forms a single pulse;

(i) said memory having a not empty indicator output connected to said third one-shot output;

(j) said not empty indicator output being combined with said third one-shot output to block any strobe pulse from said peripheral if said memory has words in storage and said any strobe pulse is not one of a said series;

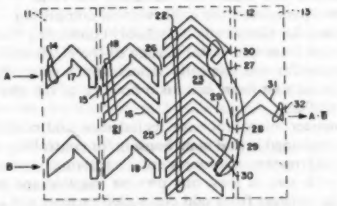
(k) means for said computer to communicate with said memory and receive said series of n-bit memory words.

4,497,042

MAGNETIC BUBBLE LOGIC APPARATUS

Richard P. Williams, Columbia, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.

Continuation of Ser. No. 251,664, Apr. 6, 1981, Pat. No. 4,435,783. This application Sep. 19, 1983, Ser. No. 533,473
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—5 **5 Claims**



1. An apparatus for propagation for magnetic bubbles, comprising:

an input stage including first and second inputs for receiving one or more bubbles;

an asymmetric strip-former stage adjacent the input stage and including a plurality of propagating elements vertically spaced so as to produce a strip extending the full height of said strip-former stage when a bubble is provided only to a first input and to form a less than full

height strip when a bubble is provided only to a second input, and

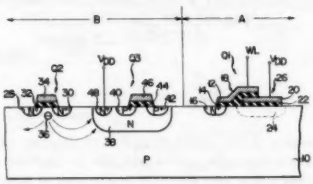
a decoding stage having a first output propagating element spaced apart from said strip former a distance sufficient to prevent propagation of all but said full-height strip onto said first output element.

4,497,043

SEMICONDUCTOR MEMORY DEVICE

Tetsuya Iizuka, Kawasaki, and Hisashi Hara, Kamakura, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 26, 1982, Ser. No. 372,008
Claims priority, application Japan, May 25, 1981, 56/78983
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—182 **8 Claims**



1. A semiconductor memory device comprising:

a semiconductor body of a first conductivity type;

first and second semiconductor regions of a second conductivity type formed in the surface of said semiconductor body;

a memory section having at least one MOS transistor of a first channel type formed in the surface of said first semiconductor region and acting as a transfer gate; and

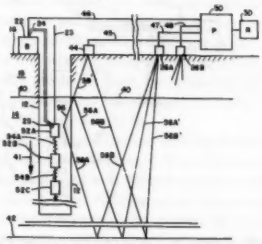
a peripheral circuit including at least a second MOS transistor of a second channel type formed in the surface of said semiconductor body and a third MOS transistor of said first channel type formed in the surface of said second semiconductor region.

4,497,044

SEISMIC WAVE GENERATOR

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Filed Jan. 7, 1982, Ser. No. 337,678
Int. Cl.³ G01V *1/02, 1/28*
U.S. Cl. 367—41 **34 Claims**



22. In a seismograph exploration system, including a seismic wave generator, comprising an array of a plurality of impulse sources (IS) which can be activated in the earth in a known time sequence, said ISs positioned at different depths below the surface of the earth, the depths of at least two being known, at least one seismic sensor spaced apart from said ISs, amplifier means and recording means, the method of operation to provide optimum information of the subsurface, comprising the steps of;

(a) initiating sequentially the plurality of ISs in said vertical array in a first known time sequence;

(b) detecting the seismic waves generated in the earth by said initiations, at a first sensor displaced from said array, and producing, and at least temporarily storing, a first electrical signal; produced by said first sensor;

(c) producing a second electrical signal comprising a time series of electrical pulses, equal in number to said ISs, in a time sequence equal to said first time sequence, as modified by the relative vertical positions of said ISs and the known velocity of seismic waves in the earth;

(d) correlating said first signal with said second signal to produce a first correlogram;

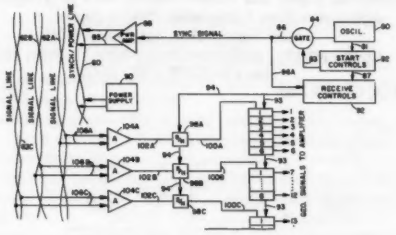
whereby said first correlogram will indicate the presence of upward reflected seismic waves from below said array, generated by the downtraveling seismic waves from said array.

4,497,045

SEISMIC SYSTEM WITH SIGNAL MULTIPLEXERS

Sheldon M. Miller, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.

Filed Apr. 20, 1981, Ser. No. 255,378
Int. Cl.³ G01V *1/22*
U.S. Cl. 367—78 **13 Claims**



13. In a seismic data acquisition system having a multi-conductor cable having at least N cable segments, where N is greater than 1, and P takeouts in each segment, for a total of at least NP different seismic signals and including in each cable segment at least one multiplexer for sequentially multiplexing said P takeout signals and transmitting them over a single independent conductor pair to a recording truck, the method of operation, comprising the steps of:

(a) providing a synchronizing signal from the recording truck to each of said N multiplexers; one in each segment;

(b) at a first of said N multiplexers in a first cable segment sequentially sampling each of the P takeout signals in said first segment and transmitting them along a single conductor pair in said cable to said recording truck; and

(c) at the recording truck demultiplexing said multiplexed signals from said first segment; while simultaneously

(d) sequentially sampling each of the other P takeouts in each of the other N−1 segments through each of the other N−1 conductor pairs; and simultaneously

(e) at the recording truck demultiplexing each of said N multiplexed signals.

4,497,046

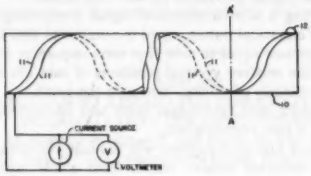
LONG LINE HYDROPHONE

Howard T. Savage, Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1981, Ser. No. 278,300
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—169 **6 Claims**

1. A long line hydrophone comprising a long hollow compliant tube, the tube being tightly wound with multiple bifilar

ribbons, with combined means to supply constant current to each bifilar ribbon at high frequency, each bifilar ribbon consisting of a magnetorestrictive material and where the compliant tube is filled with a suitable liquid and where the liquid moves to change the shape of the tube and to change the length



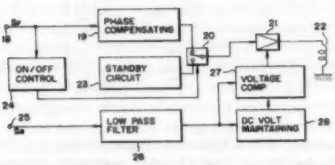
and magnetoresistive properties of the bifilar ribbons in response to stress on the tube that produces a change in voltage and where the bifilar ribbons are connected to a low voltage DC bias, a constant current, high frequency source and means to measure the change in voltage.

4,497,047

OPTICAL DISC PLAYER WITH FOCUS CONTROL DURING SEARCH MODE

Kazuhiko Fujiie, and Chiaki Nonaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,704
Claims priority, application Japan, May 11, 1981, 56-70416
Int. Cl.³ G11B *7/00, 21/12*
U.S. Cl. 369—45 **10 Claims**



1. In an apparatus for optically reading information recorded in substantially parallel tracks on a record medium surface: the combination of

optical pickup means including objective lens means through which a light beam is to be focused at said record medium surface, and being shiftable as a unit, transverse to said tracks for determining the track to be scanned by said focused beam;

focusing control means responsive to defocusing of said light beam at said record medium surface to move said objective lens means in the direction for restoring correct focus of said light beam at said surface; and

gain control means for reducing the gain with which said focusing control means responds to said defocusing when said focused beam moves transversely across a plurality of said tracks on said record medium stylus.

4,497,048

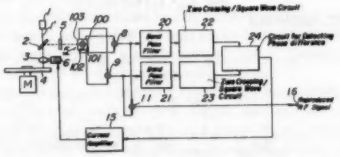
TECHNIQUE FOR CONTROLLING TRACKING IN AN OPTICAL DISC APPARATUS

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co. Ltd., Japan

Filed Apr. 16, 1982, Ser. No. 369,085
Claims priority, application Japan, Apr. 22, 1981, 56-59662
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—46 **5 Claims**

1. In a tracking control method for correcting the tracking error of a beam spot projecting upon a rotating optical disc having information recorded in the form of pits forming tracks, to correct deviation of the beam spot with respect to said tracks in a radial direction of said disc, wherein the method includes the steps of receiving a light beam modulated by the pits of said disc by a plurality of photoelectric detectors, producing a plurality of output signals representing a two-dimensional pattern of the light beam impinging upon said detectors in response to deviation of said beam spot from said tracks causing a tracking error, processing said signals to produce a tracking error signal, and correcting the tracking error of said beam spot in response to said tracking error signal, wherein the improvement in said receiving, producing and processing steps comprise:

receiving the light beam by four photodetector regions divided in mutually orthogonal directions, one direction



extending in the radial direction of the disc and the other direction extending perpendicular to said one direction;

producing a first sum signal from the output signals of a first pair of said photodetector regions diagonally positioned with respect to one another and a second sum signal from the output signals of a second pair of said photodetector regions diagonally positioned with respect to one another;

processing said first and second sum signals to etect a phase difference between said first and second sum signals to produce a phase difference signal representing the direction and magnitude of the tracking error; and

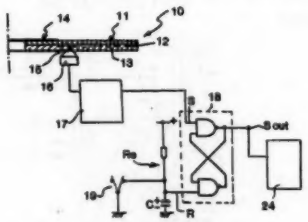
deriving said tracking error signal from said phase difference signal.

4,497,049

SYSTEM FOR DETECTING THE OPERATIVE FACE OF A DISC CARRYING DATA ON ONE FACE ONLY

Stephane M. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Staar S. A., Brussels, Belgium

Filed Feb. 18, 1983, Ser. No. 467,938
Claims priority, application Belgium, Feb. 25, 1982, 892,274
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—50 **10 Claims**



1. A detector system for turntable apparatus for detecting the operative face of a record disc carrying data on one face only comprising, in combination:

means for reading data carried adjacent a face of a record disc and operative to produce a data or no-data signal on reading the face of a record disc in said turntable apparatus,

circuit means including a delay circuit having a time constant defining a time interval, a switch actuable to start said time interval, and

a memory circuit connected to the output of said reading

means to receive said data or no-data signal during said time interval, said circuit means producing an output signal indicating the operative face of a record disc upon said memory circuit receiving a data signal within said time interval after said switch is actuated.

4,497,050

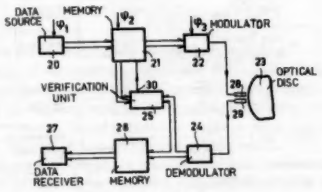
METHOD AND DEVICE FOR WRITING A DATA BLOCK INTO A RECORD CARRIER BODY

Tsjalling Beetstra, Apeldoorn, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 289,665, Aug. 3, 1981,. This application Oct. 21, 1983, Ser. No. 543,794

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—59 **2 Claims**



1. A method of writing information in a record carrier body having a writing area provided with successively arranged sectors, each of said sectors comprising a heading field, a first and a second plurality of user segment locations, said second plurality being significantly fewer in number than said first plurality, said method comprising:

(1) in a first phase, providing a replicated ready to use record carrier body of standard surface disposition, which record carrier body comprises standard information stored in said heading field;

(2) in a second phase:

(a) loading into a first random-access memory location, first user information to be written into said first plurality of user segment locations of one sector;

(b) adding appropriate error correction bits to the first user information loaded into said first random access memory location;

(c) writing in an interleaved manner in a bit serial sequence into said first plurality of user segment locations of one sector, both the first user information and the added error correction bits loaded into said first random-access memory location;

(3) in a third phase, separated in time from said second phase, which time is substantially longer than the time required to write into a sector of said record carrier body:

(a) loading into a second random-access memory location second user information to be written into said second plurality of user segment locations, said second user information updating said first user information;

(b) adding appropriate error correction bits to the second user information loaded into said second random access memory location;

(c) writing in an interleaved manner in a bit serial sequence into said second plurality of user segment locations of the same sector wherein said first user information was written during said second phase, both the second user information and the added error correction bits loaded into said second random-access memory location.

4,497,051

AUTOMATIC RECORD LOADING PLAYER

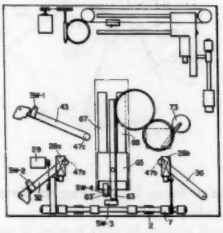
Hideyuki Takahashi; Isami Kenmotsu, and Takahiro Okajima, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,846

Claims priority, application Japan, Feb. 5, 1981, 56-16096

Int. Cl.³ G11B *17/04, 25/04*

U.S. Cl. 369—77.1 **4 Claims**



1. An automatic record loading player comprising centering means including:

(a) drive roller means (7) for moving an inserted record in a given direction to a centering position;

(b) guide levers (32, 36) having parallel rotational axes and movable to maintain abutment of both said levers with a circumference of the record;

(c) connecting means (49) between said levers for causing said levers to rotate equally in opposite directions about their respective axes;

(d) a detecting lever (43) rotating to give motion in said direction in abutment with the circumference of the record; and

(e) a plurality of switches (SW-1, SW-2), which are actuated by the rotations of said guide levers and said detecting lever, whereby by said switches, said drive roller means is controlled so that records different in diameter may be centered at the constant centering position.

4,497,052

STYLUS FOR REPRODUCING INFORMATION SIGNALS RECORDED ON A RECORDING MEDIUM

Yoshiyo Wada; Kunio Goto, and Hisao Kinjo, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 31,035, Apr. 18, 1979, Pat. No. 4,273,967, which is a continuation of Ser. No. 852,366, Nov. 16, 1977, Pat. No. 4,199,782. This application Dec. 30, 1980, Ser. No. 221,922

Claims priority, application Japan, Nov. 17, 1976, 51-137216; Feb. 25, 1977, 52-20065; Mar. 28, 1977, 52-34106

The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.

Int. Cl.³ H04N *5/80*

U.S. Cl. 369—126 **8 Claims**

1. A reproducing stylus for tracing a track on a recording medium, in which track an information signal is recorded as variations of geometrical shape, and for reproducing as variations in capacitance the information signal thus recorded, said reproducing stylus comprising:

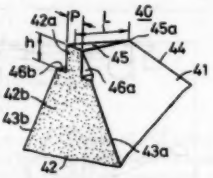
(a) a reproducing stylus main structure having a tip portion with a sliding contact face for slidingly contacting at least one track of the recording medium, said sliding contact face having a rear edge;

(b) an electrode disposed on the reproducing stylus main structure to trace said one track and reproduce the information signal as the variations in capacitance in accordance with the variations in geometrical shape, said elec-

trode comprising a first electrode part and a second electrode part continuing to the first electrode part;

(c) said first electrode part having a pair of first side edge-s originating respectively from both ends of said rear edge, a length of said rear edge being smaller than the width of the second electrode part;

(d) said reproducing stylus main structure further having a



pair of side surfaces for defining the first side edges of the first electrode part; and

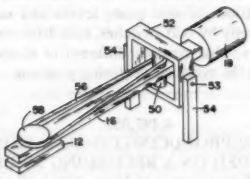
(e) said second electrode part having a pair of second side edges, the extension lines of said first side edges extending respectively towards the second electrode part being between the second side edges of the second electrode part when viewed from a direction perpendicular to said rear edge and parallel to said sliding contact face.

4,497,053

ACCURATELY TRACKING PHONOGRAPH ARM

Andrew M. Wolff, 1572 Meadow La., Mountain View, Calif. 94040

Filed Apr. 9, 1982, Ser. No. 366,832
Int. Cl.³ G11B *21/16*
U.S. Cl. 369—244 **5 Claims**



1. A tone arm system for a record player that maintains the pickup mechanism perpendicular to the groove radius, comprising;

an arm having bearing means and being adapted to be mounted for pivoting movement above a record-carrying turntable;

a pickup mechanism mounted on said arm on said bearing means that permits rotation of said pickup mechanism about a generally vertical stylus axis;

first rotating means connected to said pickup mechanism so as to convey rotational movement to the pickup mechanism;

a gimbal means having a first member, a second member, and a post rigidly attached to the first member in a generally vertical orientation, said gimbal means supporting said arm for pivoting movement about a generally vertical axis and a generally horizontal axis;

a first pivot bearing supporting said arm for pivotal rotation about the generally vertical post, said first member supported for rotation about the generally horizontal axis by said second member;

second rotating means, attached to said post so that it remains a constant distance from said first rotating means during rotation of said arm, and restrained from rotating about a vertical axis by said post so as to rotate relative to said arm when the arm pivots about said generally vertical post;

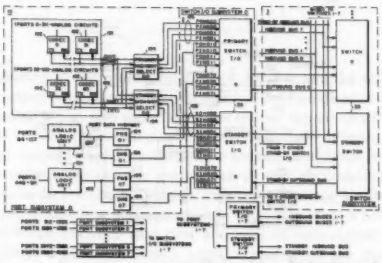
rotation transmission means, connecting said first and second rotating means so that said first rotating means rotates in response to said second rotating means at one half the angular rate of said second rotating means relative to said arm.

4,497,054

ONE-FOR-N REDUNDANCY IN A DIGITAL SWITCH MATRIX

Edgar L. Read, Carrollton, Tex., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Apr. 29, 1983, Ser. No. 490,006
Int. Cl.³ H04Q *11/04*; H04J *3/14*
U.S. Cl. 370—58 **2 Claims**



1. A redundant digital switch matrix system comprising:

(a) a plurality of primary digital switch means, each of said plurality of primary digital switch means operatively coupled to a corresponding number of input buses, each of said input buses transmitting input data in predetermined time slots from a second plurality of ports associated with each of said input buses, and each of said primary digital switch means having an output bus for transmitting output data, each output bus being associated with one of said input buses and each output bus transmitting output data to the second plurality of ports associated therewith;

(b) a standby input bus, adapted to receive the input data from a selected one of said input buses in response to at least one select control signal, said standby bus further operatively coupled to each of said plurality of primary digital switch means; and

(c) a standby digital switch means, operatively coupled to the corresponding number of input buses and further operatively coupled to the standby input bus, and further having an output bus to transmit output data;

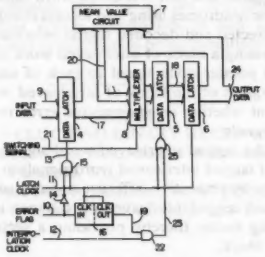
wherein each primary digital switch means and the standby digital switch means includes:

switching means for altering the switch matrix system configuration in response to at least one of said select control signals to enable the standby digital switch means to receive the input data from said input buses and said standby input bus, to effectively decouple a preselected one of said plurality of primary digital switch means from said input buses and said standby input bus, to enable the standby input bus to receive the input data from the second plurality of ports associated with the preselected one of said primary digital switch means, and to enable the output bus of said standby digital switch means to transmit the output data to the plurality of ports associated with the preselected one of said primary digital switch means, thereby effecting a substitution of said standby digital switch means for any one of said plurality of primary digital switch means.

4,497,055
DATA ERROR CONCEALING METHOD AND APPARATUS

Takashi Hoshino, Fujisawa, and Takao Arai, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,580
Claims priority, application Japan, Jun. 17, 1981, 56-92309
Int. Cl.³ G06F 11/10
U.S. Cl. 371—31 7 Claims



1. A data error concealing method comprising:

a first step of successively receiving and storing data words in input data so that, when a received data word is erroneous, the correct input data word immediately preceding the erroneous word is held in storage as a replacement word instead of the erroneous word; and

a second step in which, in association with each of the data words processed in said first step, a mean value between data words immediately preceding and immediately following that data word is produced, and in which, when the stored data word is a replacement word for an erroneous word, the replacement word is replaced by the mean value produced in association with the data word;

whereby the holding in storage of the replacement word in said first step and the replacement of the replacement word by the mean value in said second step allow error concealment in which, when an independent erroneous word is present in the input data, the erroneous word is replaced by a mean value between correct input words immediately preceding and immediately following the erroneous word, while when a continuous series of erroneous words are present in the input data, the last erroneous word in the series is replaced by the mean value between the correct input words immediately preceding and immediately following the series of continuous erroneous words and the other erroneous words of the series are replaced by the correct input words immediately preceding the continuous series of erroneous words.

4,497,056
IC TESTER

Shigeru Sugamori, Gyoda, Japan, assignor to Takeda Riken Co. Ltd., Tokyo, Japan

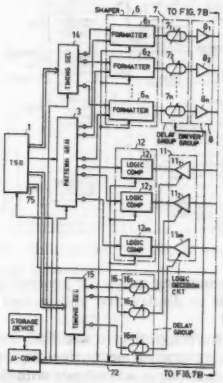
Filed Aug. 13, 1982, Ser. No. 407,872
Claims priority, application Japan, Aug. 19, 1981, 56-130599
Int. Cl.³ G01R 31/28
U.S. Cl. 371—25 20 Claims

1. An IC tester comprising

test pattern signal generating means for supplying test pattern signals with predetermined timings from each of the outputs of a plurality of N parallel channels to an IC to be tested, each of said N channels including a respective first delay element having a respective variable delay time for delaying the respective test pattern signals being provided from the respective one of the N channels,

response signal comparing means for comparing at further predetermined timings, in conjunction with said supplying of test pattern signals by said test pattern signal generating means, the logic levels of respective response signals that are input from the IC to a plurality of M parallel channels, with respective expected values for the response signals, and said response signal comparing means including for each of said M channels a respective second delay element in a respective time signal line, each said second delay element having a respective variable delay time for delaying the timing for determining the respective comparing of the response signals with the expected values, and

calibration means, operatively connected to said test pattern signal generating means and to said response signal comparing means, for automatically determining on predetermined conditions, relative travel times for signals on said N parallel channels and relative timing for said comparing of signals on said M channels, for setting the respective delay times of said first and second delay elements to suppress skews between said N channels to enable said supplying of said test pattern signals at the respective outputs of said N channels with the respective predetermined timings, and to suppress skews in the time signal lines so as to enable said comparing of said response signals with the respective predetermined timings.



4,497,057
MOTOR VEHICLE DIAGNOSTIC MONITORING SYSTEM

Takaaki Kato, Toyohashi; Yoshio Hirano, Anjo; Takeshi Ochiai, Toyota; Seizi Ishikawa, Toyota, and Kazunori Sakai, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

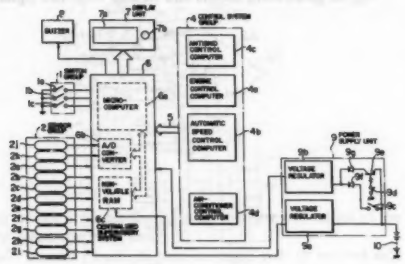
Filed Aug. 6, 1982, Ser. No. 405,903
Claims priority, application Japan, Aug. 7, 1981, 56-124234; Aug. 7, 1981, 56-124235; Aug. 7, 1981, 56-124236; Aug. 7, 1981, 56-124237
Int. Cl.³ G06F 11/00, 11/32
U.S. Cl. 371—29 9 Claims

1. A diagnostic monitoring system for a motor vehicle, comprising:

a plurality of control devices each separately controlling a part of said vehicle in accordance with a predetermined control program, each of said control devices including means for detecting abnormal operation of the respective control device in accordance with a diagnostic sub-program of said predetermined control program, and for generating abnormal operation signals in response to said detected abnormal operation signals in response to said detected abnormal operation;

central supervisory means, receiving said abnormal operation signals generated from said plurality of control devices, for separately storing abnormal operation data corresponding to said generated abnormal operation sig-

nals from each of said control devices in each of first and second memory areas, and for resetting abnormal operation data in said first memory area at a first predetermined time after a previous generation of abnormal operation signals, said reset abnormal operation data corresponding to a last generated abnormal operation signal, and for resetting the corresponding abnormal operation data in said second memory area at a second predetermined time which is longer than said first predetermined time;



command generating means for generating first and second commands to display first and second abnormal conditions; and

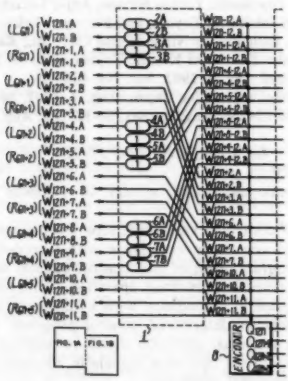
display means, responsive to said first command from said command generating means, for displaying said first abnormal conditions in accordance with the abnormal operation data stored in said first memory area, and responsive to said second command from said command generating means, for displaying said second abnormal conditions in accordance with the abnormal operation data stored at least in said second memory area.

4,497,058

METHOD OF ERROR CORRECTION

Yoichiro Sako, and Kentaro Odaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 274,262, Jun. 16, 1981, abandoned.
This application Feb. 15, 1984, Ser. No. 579,003
Claims priority, application Japan, Jun. 20, 1980, 55-84425
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—39 **12 Claims**



1. A method of decoding transmitted digital information signals to correct errors occurring therein as a result of transmission, wherein said information signals are received as blocks of interleaved digital data word signals and are applied to a first decoder as first error-correcting blocks comprised of a plurality of information word signals, a series of first check word signals associated with said plurality of information word signals, and a series of second check word signals associated with said plurality of information word signals, said information word signals and said first check word signals being interleaved, comprising the steps of:

decoding the received digital data word signals in said first decoder and correcting the decoded digital information word signals and said first check word signals by generating error syndromes using said second check word signals, the corrected and decoded digital information word signals forming a block of interleaved word signals;

tagging a pointer code signal to each of said information word signals of the block of interleaved word signals to represent whether an uncorrected error remains in such word signals;

delaying the tagged interleaved word signals of each such block of tagged interleaved word signals in a deinterleaving stage by respective different amounts so as to deinterleave such tagged interleaved word signals into a different arranging order, thereby providing a second error-correcting block;

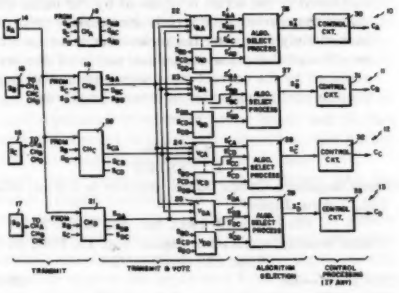
decoding the digital information word signals of each such second error-correcting block in a second decoder by generating error syndromes using said first check word signals, then comparing, for each said second error-correcting block, the number of erroneous word signals as indicated by said pointer code signals with a predetermined value and, if such number is less than said value, correcting said at least one erroneous word signal by said syndromes and said first check word signals, and then clearing the pointer code signals associated with the corrected erroneous word signals, but, if such number exceeds such value, leaving such pointer code signals uncleared and said at leat one erroneous word uncorrected.

4,497,059

MULTI-CHANNEL REDUNDANT PROCESSING SYSTEMS

T. Basil Smith, Sudbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 28, 1982, Ser. No. 372,734
Int. Cl.³ G06F *11/18*
U.S. Cl. 371—36 **14 Claims**



1. An information handling system which includes a plurality of redundant information handling channels and at least one input signal supplied to one of said channels, said system comprising

timing means for maintaining the operation of said channels in tight synchronism;

means in said one channel for transmitting said input signal received thereby to all other channels;

means in each said other channel for receiving the transmitted input signal from said one channel and for re-transmit-

ting said received signals to all of said plurality of channels;

means in each of said channels for receiving said re-transmitted signals;

voting means in each of said channels responsive to the received re-transmitted signals from said other channels for providing a voted output signal in each channel; and

means responsive to the voted output signals for determining the substantial identity of voted output signals from all unfailed channels, any channel not providing a voted output signal which corresponds to said substantially identical voted output signals being identifiable as a failed channel.

4,497,060

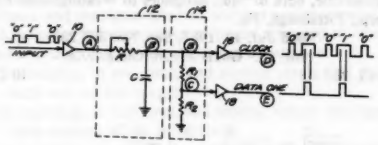
SELF-CLOCKING BINARY RECEIVER

John P. Yang, Belle Mead, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Dec. 8, 1982, Ser. No. 447,956

Int. Cl.³ H04L *7/06*

U.S. Cl. 375—22 **10 Claims**



1. In a data receiver for receiving input binary data in which 1 and 0 logic levels are represented by signals having first and second different pulsewidths, respectively, said receiver comprising means responsive to the received input binary data for integrating the same and for producing corresponding signals of first and second levels, means coupled to said integrating means for establishing from said integrated signals clock-control signals at a first node and data-control signals at a second node, and first and second switching means respectively connected to said first and second nodes for respectively producing at their outputs a clock signal for each input data signal and a data signal for each input data signal at only one of said first and said second pulsewidths.

4,497,061

METHOD AND APPARATUS FOR RADIOGRAPHY COMPRISING CALIBRATING MEANS

Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 758,147, Jan. 10, 1977, abandoned, which is a division of Ser. No. 481,443, Jun. 21, 1974, Pat. No. 4,035,647, which is a division of Ser. No. 358,890, May 10, 1973, Pat. No. 3,881,110. This application Jan. 16, 1978, Ser. No. 869,711

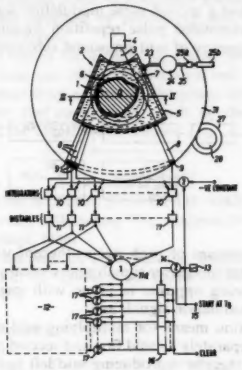
Claims priority, application United Kingdom, May 17, 1972, 23064/72

Int. Cl.³ A61B *6/00, 6/02;* G01N *23/02*

U.S. Cl. 378—18 **11 Claims**

1. A method of operating an apparatus for examination of objects by means of X-radiation comprising the steps of:

generating X-radiation for propagation along a plurality of beam paths which are at different angles to each other and in a substantially planar section, sensing the radiation propagated along said beam paths, introducing into said substantially planar section successive portions of a calibration device, said successive portions having different known absorption characteristics such that the radiation propagated along said plurality of paths is successively subjected to said different absorption characteristics, measuring the amount of radiation sensed by the detectors for said different portions of the calibration device and deriving a calibration characteristic for each of the detectors from the last recited measuring, and storing indications of



said calibration characteristic for use in examinations of objects with said apparatus.

4,497,062

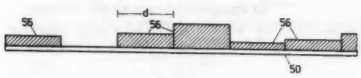
DIGITALLY CONTROLLED X-RAY BEAM ATTENUATION METHOD AND APPARATUS

Charles A. Mistretta; Walter W. Peppler, both of Madison; Balakrishna V. Kudva, Monona; Bruce H. Hasegawa, and James T. Dobbins, III, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jun. 6, 1983, Ser. No. 501,607

Int. Cl.³ G03B *41/16;* H05G *3/00*

U.S. Cl. 378—158 **39 Claims**



35. A method of compensating the X-ray image of an object, comprising the steps of:

(a) printing X-ray attenuating material from a ribbon having X-ray attenuating material thereon onto a substrate in layers forming an image to provide a compensation mask;

(b) inserting the compensation mask in registered position between an X-ray source and an object; and

(c) exposing the object to an X-ray beam passed through the compensation mask and recording the image of the X-ray beam after passing through the mask and the object.

4,497,063

FM STEREO DEMODULATOR

Kohji Ishida; Tadashi Noguchi, and Tatsuo Numata, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,130

Claims priority, application Japan, Jun. 26, 1981, 56-99920; Jun. 26, 1981, 56-99921

Int. Cl.³ H04H *5/00*

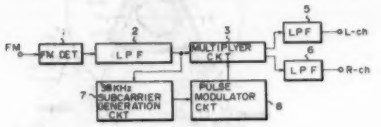
U.S. Cl. 381—7 **9 Claims**

1. An FM stereo demodulator connected to an FM detector circuit for reproducing left and right signals from a stereo composite signal demodulated at the FM detector circuit from an FM-IF signal comprising:

a subcarrier signal generating means responsive to said stereo composite signal for generating a sinusoidal subcarrier

signal synchronized with a pilot signal component of said stereo composite signal;

a pulse generation means responsive to said sinusoidal subcarrier signal, for generating a first pulse modulation signal and a second pulse modulation signal, each having a predetermined pulse repetition frequency higher than the frequency of said sinusoidal subcarrier signal and the



edge positions of each pulses thereof varying with said sinusoidal subcarrier signal, said second pulse modulation signal being opposite in phase with respect to said first pulse modulation signal; and

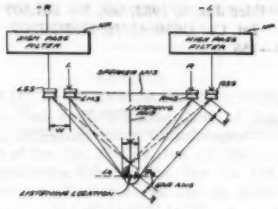
multiplication means for multiplying said stereo composite signal separately by said first and second pulse modulation signals, thereby reproducing said left and right signals.

4,497,064

METHOD AND APPARATUS FOR REPRODUCING SOUND HAVING AN EXPANDED ACOUSTIC IMAGE

Matthew S. Polk, Baltimore, Md., assignor to Polk Audio, Inc., Baltimore, Md.

Filed Aug. 5, 1982, Ser. No. 405,341
Int. Cl.³ H04R 5/00
U.S. Cl. 381—24 **23 Claims**



1. In a stereophonic sound reproduction system having a left channel output and a right channel output, apparatus for reproducing nonbinaural recorded sound having an expanded acoustic image comprising:

a right main speaker and a left main speaker disposed respectively at right and left main speaker locations equidistantly spaced from a listening location, the listening location being a place in space for accommodating a listener's head facing the main speakers and having a right ear location and a left ear location along an ear axis, with the right and left ear locations separated along the ear axis by a maximum interaural sound distance of Δt_{max} and the listening location being defined as the point on the ear axis equidistant to the right and left ears, the listening location being spaced from the main speakers and defining a listening angle with respect thereto to result in an interaural time delay Δt of the right and left ear locations along the listening angle to the left and right main speakers,

at least one right sub-speaker and at least one left sub-speaker disposed respectively at right and left sub-speaker locations equidistantly spaced from the listening location;

the right and left sub-speaker locations being spaced from the respective right and left main speaker locations such that the inter-speaker delay of the right sub-speaker over the right main speaker with respect to the right ear location and the inter-speaker delay of the left sub-speaker over the left main speaker with respect to the left ear location are each approximately the same as the interaural time delay Δt;

means for coupling the right and left channel outputs, respectively, to said right and left main speakers;

means connected to the right and left channel outputs for developing an inverted right channel signal and an inverted left channel signal;

means for coupling the inverted right channel signal to said at least one left sub-speaker and the inverted left channel signal to said at least one right sub-speaker;

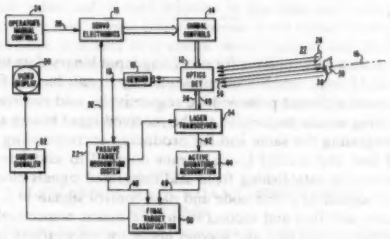
whereby sound reproduced by said apparatus as perceived by a listener whose head is located generally at the listening location has an expanded acoustic image.

4,497,065

TARGET RECOGNITION SYSTEM ENHANCED BY ACTIVE SIGNATURE MEASUREMENTS

Glenn E. Tisdale, Severna Park, and Harley B. Lindemann, Catonsville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 12, 1982, Ser. No. 397,258
Int. Cl.³ G01B 11/26; G06K 9/00
U.S. Cl. 382—1 **10 Claims**



1. An electro-optical target recognition system which operates on both active and passive radiation from the field of view thereof to discriminate desired targets from detected candidate targets, said system comprising:

at least one passive sensor for receiving passive image radiation from the field of view thereof and converting said received image radiation into first electrical signals representative thereof;

a passive target recognition means for operating on said first electrical signals to detect candidate targets in said field of view of said passive sensor;

an active source for generating a laser beam substantially at a predetermined wavelength;

means for positioning said laser beam to illuminate individually each of said candidate targets detected by said passive target recognition means;

an active sensor tuned to said predetermined wavelength for receiving the active laser radiation separately reflected from said individually illuminated candidate targets and converting said separately received active laser radiation into respective second electrical signals representative thereof;

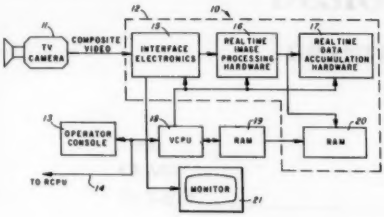
means by deriving an active signature for each of said detected candidate targets from said respective second electrical signals; and

means operative to discriminate a desired target from said detected candidate targets in said field of view of said passive sensor based on said derived active target signatures thereof prior to acquisition and tracking of said desired target.

4,497,066
VIDEO DATA ACQUISITION SYSTEM

Alfred Gasparri, Jr., Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 5, 1982, Ser. No. 355,287
Int. Cl.³ G06K *9/32*
U.S. Cl. 382—48 **31 Claims**



1. A method of acquiring video data in a video data acquisition system having a video camera for forming an image of an article wherein a serial stream of data from the video camera is digitized, and the signal selected within a predetermined amplitude range as representations of pixels arranged in rows, columns and diagonal lines, comprising the steps of:

(a) counting, in real time, and storing pixels that appear in each row of the image;

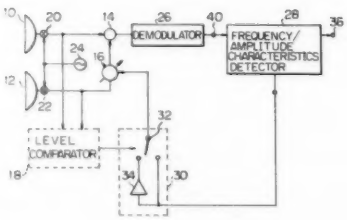
(b) counting, in real time, and storing signals that appear in each column of the image; and

(c) counting, in real time, and storing pixels that appear in each diagonal line of the image.

4,497,067
INTERFERENCE CANCELLATION TYPE SPACE DIVERSITY SYSTEM

Junji Namiki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 11, 1983, Ser. No. 512,705
Claims priority, application Japan, Jul. 14, 1982, 57-122715
Int. Cl.³ H04B *7/08*
U.S. Cl. 455—273 **1 Claim**



1. An interference cancellation type space diversity system for receiving signals coming in through two spaced antennas and a combiner means for combining the input signals into a single signal, said system comprising:

phase shifter means for controlling the output phase of one of the antennas;

comparator means for comparing intensities of the signals individually received by the antennas;

demodulator means for getting baseband signals from a combined output of the antennas;

correlator means for producing at least one correlation between an output of the demodulator means and a plurality of signals obtained by processing said output of the demodulator means;

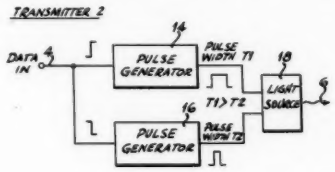
identification means for identifying a sign of an imaginary part of at least one of the correlations; and

means for controlling a phase in the phase shifter means in response to the comparison result of the comparator means and the identification means.

4,497,068
ENCODING SYSTEM FOR OPTIC DATA LINK

Kenneth C. Fischer, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 25, 1982, Ser. No. 342,522
Int. Cl.³ H04B *9/00*; **H03K** *13/24*
U.S. Cl. 455—608 **2 Claims**



1. Encoding circuitry for an optic digital data link, comprising:

(1) a transmitter for encoding digital data, comprising:

(a) a first pulse generator for generating a pulse of width **T1** in response to data state transition of one polarity;

(b) a second pulse generator for generating a pulse of width **T2**, where **T2<T1**, in response to an opposite polarity data state transition; and

(c) light source means driven by said pulse generators for outputting an optic signal of correspondent pulse width; and

(2) a receiver for decoding said optic signal to reconstitute said digital data, comprising:

(a) light detector means for receiving said optic signal and outputting a correspondent pulse width; and

(b) decoder means driven by said light detector means and outputting a digital signal transitioning to said one polarity in response to pulse width **T1**, and transitioning to said opposite polarity in response to pulse width **T2**, whereby to reconstitute said digital data;

wherein said decoder means comprises:

a third pulse generator for generating a pulse of width **T3**, where **T1>T3>T2**, in response to a given polarity transition of said signal from said light detector means; and

means comparing pulse width **T3** against the width of the pulse from said light detector means and outputting a data signal which transitions to said one polarity when the pulse width from said light detector means is greater than **T3**, and which transitions to said opposite polarity when the pulse width from said light detector means is less than **T3**.

DESIGN PATENTS

GRANTED JAN. 29, 1985

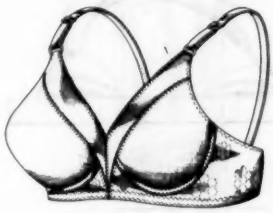
ERRATA

For CLASS	See PATENT NO.
D13–029	277,370

DESIGNS

JANUARY 29, 1985

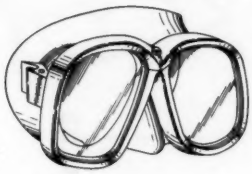
277,329
BRASSIERE
Toshiko Taniyama, White Plains, N.Y., assignor to International Playtex, Inc., Stamford, Conn.
Filed Aug. 23, 1982, Ser. No. 410,209
Term of patent 14 years
U.S. Cl. D2—24



277,330
HEADBAND
John J. Wasson, 6329 Masonic Dr., Alexandria, La. 71301
Filed Feb. 23, 1981, Ser. No. 237,181
Term of patent 14 years
U.S. Cl. D2—230

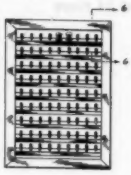
277,331
HOCKEY HELMET
Leonard W. H. Clement, Bolton, Canada, assignor to Cooper Canada Limited, Toronto, Canada
Filed Oct. 12, 1982, Ser. No. 433,775
Claims priority, application Canada, Sep. 22, 1982, 22-09-82-3
Term of patent 14 years
U.S. Cl. D2—232

277,332
DUAL-LENS DIVING MASK
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Continuation of Ser. No. 413,738, Sep. 1, 1982, abandoned. This application Sep. 30, 1982, Ser. No. 429,285
Term of patent 14 years
U.S. Cl. D2—234

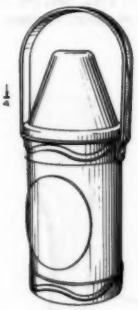


277,333
SPORT SOX
Denis Abramowitz, 601 B Surf Ave., Apt. 152, Brooklyn, N.Y. 11224
Filed Aug. 18, 1982, Ser. No. 409,161
Term of patent 14 years
U.S. Cl. D2—331

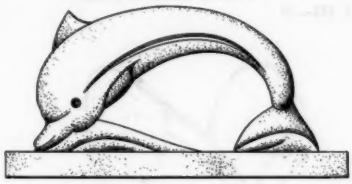
277,334
SPOOL AND BOBBIN RACK
Gordon Ristow, 2307 N. Appleton, Appleton, Wis. 54911
Filed Oct. 27, 1981, Ser. No. 315,500
Term of patent 14 years
U.S. Cl. D3—25



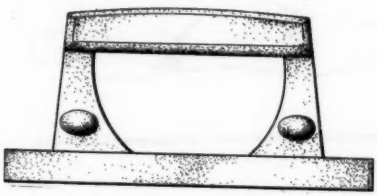
277,335
CONTAINER FOR ARTISTS' MATERIALS OR SIMILAR ARTICLES
Sheldon Lieberman, Allentown, Pa., assignor to Binney & Smith, Inc., Easton, Pa.
Filed Aug. 23, 1982, Ser. No. 410,531
Term of patent 14 years
U.S. Cl. D3—44



277,336
HANDLE FOR A BAG
Maxime Parrochia, Quartier de l'Ilate, La Verpilliere 38290, France
Filed Apr. 1, 1982, Ser. No. 364,331
Claims priority, application France, Oct. 23, 1981, 813658
Term of patent 14 years
U.S. Cl. D3—54

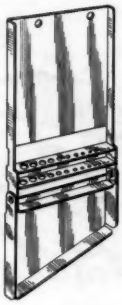


277,337
HANDLE FOR A BAG
Maxime Parrochia, Quartier l'Ilate, La Verpilliere 38290, France
Filed Apr. 1, 1982, Ser. No. 364,375
Claims priority, application France, Oct. 23, 1981, 813655
Term of patent 14 years
U.S. Cl. D3—54



277,338
SEPARABLE HOLDER FOR KEYS AND THE LIKE
Luis Cuttler, Lomas Hipódromo, Mexico, assignor to Fabrica De Armazones Opticos, S.A., Mexico City, Mexico
Filed Sep. 29, 1982, Ser. No. 428,120
Term of patent 14 years
U.S. Cl. D3—61

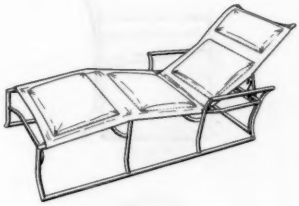
277,339
DRILL CASE
Henry E. Huot, Jr., St. Paul; William J. Huot, and Warren J. Olson, both of Mahtomedi, all of Minn., assignors to Huot Manufacturing Co., St. Paul, Minn.
Filed Dec. 27, 1982, Ser. No. 453,490
Term of patent 14 years
U.S. Cl. D3—74



277,340
JEWELRY BOX OR SIMILAR ARTICLE
Michael E. Christen, Rte. 1, Box 80, Merna, Nebr. 68856
Filed Jul. 19, 1982, Ser. No. 399,371
Term of patent 14 years
U.S. Cl. D3—75

277,341
SEAT
John W. Caldwell, San Marino, Calif., assignor to Pacific Furniture Mfg. Co., Compton, Calif.
Filed Aug. 21, 1981, Ser. No. 295,050
The portion of the term of this patent subsequent to Mar. 20, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366

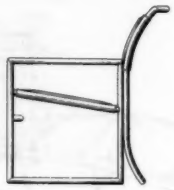
277,342
CHAISE LOUNGE
Joel A. Kramer, Bradenton, Fla., and Alton A. Harper, Tustin, Calif., assignors to Tropitone Furniture Company, Inc., Sarasota, Fla.
Filed Sep. 30, 1982, Ser. No. 430,164
Term of patent 14 years
U.S. Cl. D6—361



277,343
CHAIR
Robert K. Thorpe, Laguna Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Mar. 29, 1982, Ser. No. 362,969
Term of patent 14 years
U.S. Cl. D6—369

277,344
UPHOLSTERED FURNITURE
Skip Johnson, Dunwoody, Ga., assignor to The Bean Station Furniture Factory, Bean Station, Tenn.
Filed Jul. 12, 1982, Ser. No. 397,467
Term of patent 14 years
U.S. Cl. D6—381

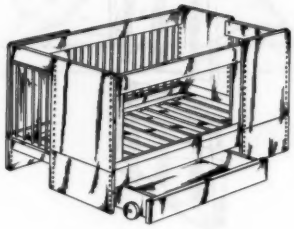
277,345
CHAIR
Joel A. Kramer, Bradenton, Fla., and Alton A. Harper, Tustin, Calif., assignors to Tropitone Furniture Company, Inc., Sarasota, Fla.
Filed Sep. 29, 1982, Ser. No. 432,111
Term of patent 14 years
U.S. Cl. D6—373



277,346
ARMCHAIR
Ned Steinberger, Brooklyn, N.Y., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Nov. 1, 1982, Ser. No. 438,673
Term of patent 14 years
U.S. Cl. D6—374

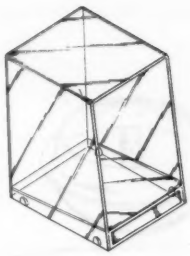
277,347
TOILET ROLL HOLDER
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, South Australia, Australia
Filed Dec. 3, 1982, Ser. No. 446,857
Claims priority, application Australia, Oct. 12, 1982, 1824/82
Term of patent 14 years
U.S. Cl. D6—97

277,348
CONVERTIBLE BED
James R. Hull, 148 S. Westgate Ave., Los Angeles, Calif. 90049
Filed Apr. 12, 1982, Ser. No. 367,161
Term of patent 14 years
U.S. Cl. D6—384



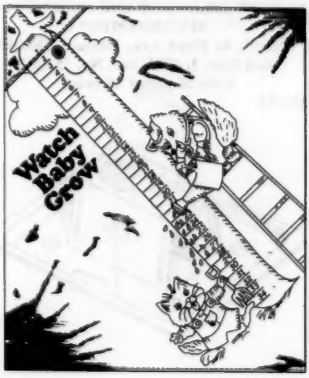
277,349
ADJUSTABLE AUXILIARY CLOSET ROD UNIT
Frank P. Campbell, 13463 W. 78th Pl., Arvada, Colo. 80005
Continuation-in-part of Ser. No. 139,660, Apr. 14, 1980, abandoned. This application Jul. 15, 1982, Ser. No. 398,573
Term of patent 14 years
U.S. Cl. D6—513

277,350
BOOKCASE FOR TELEPHONE DIRECTORIES
Kim F. Smith, Katy, Tex., assignor to Neal J. Mosely, Houston, Tex., a part interest
Filed Aug. 24, 1981, Ser. No. 295,764
Term of patent 14 years
U.S. Cl. D6—471



277,351
TABLE
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti Industria Arredamenti di Saporiti Sergio e Giorgio S.N.C., Besnate, Italy
Filed Aug. 9, 1982, Ser. No. 406,634
Term of patent 14 years
U.S. Cl. D6—483

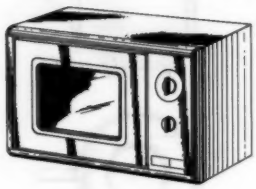
277,352
BABY TOWEL
Myra Klein, 3745 NE. 171 St. #29, North Miami Beach, Fla. 33160
Filed May 13, 1982, Ser. No. 377,915
Term of patent 14 years
U.S. Cl. D6—609



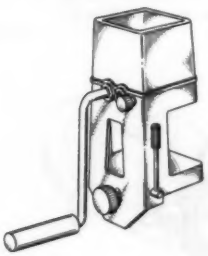
277,353
TEACUP
Walter Everhan, Weisshausstrasse 34-38, D-5000 Kohn 41, Fed. Rep. of Germany
Filed Nov. 3, 1982, Ser. No. 438,980
Term of patent 14 years
U.S. Cl. D7—9

277,354
BEVERAGE MUG
Susan H. Levine, 235 S. 2nd St., Richmond, Calif. 94804
Filed May 10, 1984, Ser. No. 608,709
Term of patent 14 years
U.S. Cl. D7—9

277,355
MICROWAVE OVEN
Takao Miyake; Masayoshi Kawaishi, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 30, 1982, Ser. No. 454,692
Term of patent 14 years
U.S. Cl. D7—351

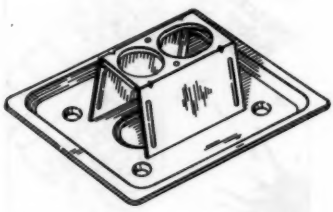


277,356
HAND OPERATED FOODSTUFF MILL
Thomas D. Dickson, Jr., 1099 Del Cambre, San Jose, Calif. 95129, and Ralph W. Schwarze, 12468 Robleda Rd., Los Altos Hills, Calif. 94022
Filed Aug. 17, 1982, Ser. No. 408,810
Term of patent 14 years
U.S. Cl. D7—372



277,357
STEAMER
Susan H. Levine, 152 Washington Ave., Point Richmond, Calif. 94801
Filed Jun. 24, 1982, Ser. No. 391,694
Term of patent 14 years
U.S. Cl. D7—409

277,358
TRAY FOR PORTABLE PROPANE TORCH, TOOLS AND ACCESSORIES
Charles J. Krencik, 86 Floyd Ave., Dayton, Ohio 45415
Filed Mar. 1, 1982, Ser. No. 353,617
Term of patent 14 years
U.S. Cl. D8—71



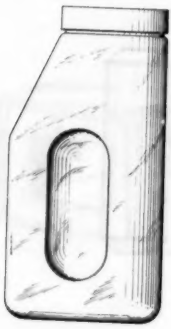
277,359
PRY BAR
James P. Schiller, 2510 Crestview Dr. South, Salem, Oreg. 97302
Filed Jun. 14, 1982, Ser. No. 388,101
Term of patent 14 years
U.S. Cl. D8—89

277,360
COSMETIC BOTTLE
Yoichi Kaneko, Tokyo, Japan, assignor to Shiseido Company Ltd., Tokyo, Japan
Filed May 17, 1982, Ser. No. 378,467
Term of patent 14 years
U.S. Cl. D9—352

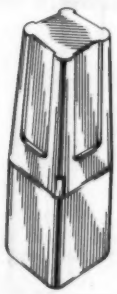
277,361
CONTAINER BODY
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan
Filed Jun. 30, 1982, Ser. No. 393,792
Claims priority, application Japan, Oct. 22, 1981, 56/46675
Term of patent 14 years
U.S. Cl. D9—355

277,362
OIL CONTAINER OR THE LIKE
Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Associates, Inc., Okmulgee, Okla.
Filed Aug. 25, 1982, Ser. No. 411,861
Term of patent 14 years
U.S. Cl. D9—370

277,363
JAR OR SIMILAR ARTICLE
Archie G. Drummond, Jr., Palatine, and Dale E. Fahnstrom, Riverside, both of Ill., assignors to Tone Brothers, Inc., Des Moines, Iowa
Filed Sep. 28, 1982, Ser. No. 426,166
Term of patent 14 years
U.S. Cl. D9—372

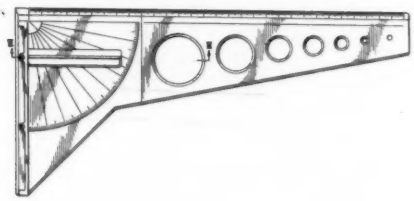


277,364
CONTAINER FOR ADHESIVE
William T. Nightingale, III, Campbell, Calif., assignor to Pacer Technology and Resources, Inc., Campbell, Calif.
Filed Apr. 16, 1982, Ser. No. 369,266
Term of patent 14 years
U.S. Cl. D9—424

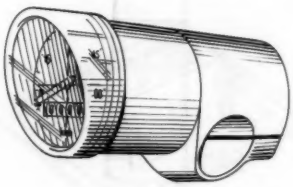


277,365
PROPORTIONAL PLOTTING DEVICE
Gary M. Sogorka, 78 Gould Rd., Newfoundland, N.J. 07435
Filed Jun. 23, 1982, Ser. No. 391,483
Term of patent 14 years
U.S. Cl. D10—61

277,366
MARKING OUT TOOL
William K. Hayward, 27 Guildford Rd., Farnborough, Hants, England
Filed Sep. 27, 1982, Ser. No. 424,585
Claims priority, application United Kingdom, Apr. 6, 1982, 1006028
Term of patent 14 years
U.S. Cl. D10—62



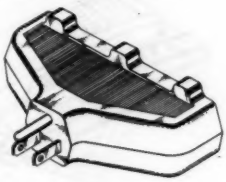
277,367
SPEEDOMETER/ODOMETER
Roger Huret, deceased, late of Nanterre, France; by Jeannine P. G. M. Huret, heir, Nanterre, France; by Alain Huret, heir, Bougival, France, and by Gerard Huret, heir, Nanterre, France, assignors to Huret et ses Fils, a French "societe anonyme", France
Filed Sep. 14, 1981, Ser. No. 301,497
Claims priority, application France, Mar. 16, 1981, 810 960
Term of patent 14 years
U.S. Cl. D10—98



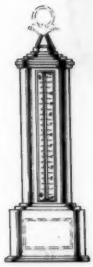
277,368
JEWELRY CHAIN
Masao Otake, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan
Filed Dec. 21, 1982, Ser. No. 451,803
Claims priority, application Japan, Oct. 15, 1982, 57-46819
Term of patent 14 years
U.S. Cl. D11—13

277,369
JEWELRY CHAIN
Masao Otake, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan
Filed Dec. 21, 1982, Ser. No. 451,804
Claims priority, application Japan, Oct. 15, 1982, 57-46820
Term of patent 14 years
U.S. Cl. D11—13

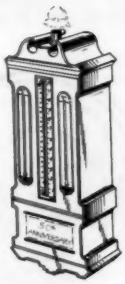
277,370
ELECTRICAL ADAPTER
Norbert Gehr, Pacific Palisades, and Michael J. Hope, Covina, both of Calif., assignors to Century Wire Gehr Industries, Inc., Pico Rivera, Calif.
Filed May 20, 1982, Ser. No. 380,230
Term of patent 14 years
U.S. Cl. D13—29



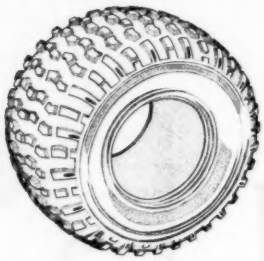
277,371
TROPHY HAVING A VERTICAL TIME DISPLAY
Iroy N. Sonier, R.R. 1 Box 453, Cocagne NB, Canada E0A LK0)
Filed Sep. 23, 1983, Ser. No. 535,062
Term of patent 14 years
U.S. Cl. D11—131



277,372
WALL PLAQUE HAVING A VERTICAL TIME DISPLAY
Iroy N. Sonier, R.R. 1 Box 453, Cocagne NB, Canada E0A LK0
Filed Sep. 23, 1983, Ser. No. 535,063
Term of patent 14 years
U.S. Cl. D11—140

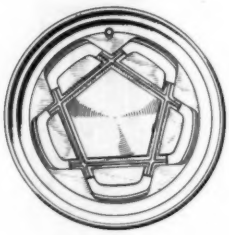


277,373
PNEUMATIC TIRE
Masamichi Tsujimoto, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Apr. 1, 1982, Ser. No. 364,512
Claims priority, application Japan, Dec. 9, 1981, 56-54767
Term of patent 14 years
U.S. Cl. D12—140

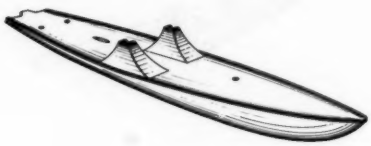


277,374
STEERING WHEEL FOR MOTOR VEHICLE
Tsutomu Koinuma, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 5, 1982, Ser. No. 365,879
Claims priority, application Japan, Oct. 6, 1981, 56-44253
Term of patent 14 years
U.S. Cl. D12—176

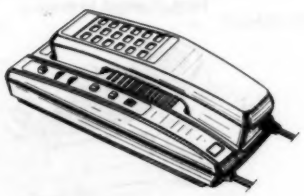
277,375
MOTOR VEHICLE WHEEL
Giorgetto Giugiaro, Turin, Italy, assignor to Gilardini S.p.A., Turin, Italy
Filed Sep. 8, 1982, Ser. No. 415,875
Claims priority, application Italy, Mar. 15, 1982, 53054-B/82[U]
Term of patent 14 years
U.S. Cl. D12—209



277,376
CENTER HULL FOR A TRIMARAN
Jonathan J. Mason, and John Bowen, both of Sydney, Australia, assignors to J. & J. Marine Pty. Ltd., New South Wales, Australia
Filed Jan. 7, 1982, Ser. No. 337,675
Claims priority, application Australia, Jul. 13, 1981, 84614
Term of patent 14 years
U.S. Cl. D12—304

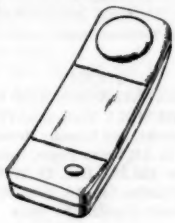


277,377
TELEPHONE SET
Masaharu Tarao, and Katsuhito Watanabe, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jun. 17, 1982, Ser. No. 378,488
Claims priority, application Japan, Jan. 12, 1982, 57-00505
Term of patent 14 years
U.S. Cl. D14—53

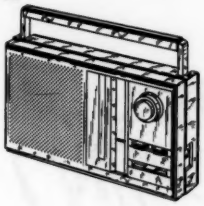


277,378
HANDSET TELEPHONE INSTRUMENT
Kenneth R. Cooke, New York, and Vito L. Porcelli, Ossining, both of N.Y., assignors to AT&T Technologies, Inc., New York, N.Y.
Filed Jan. 16, 1984, Ser. No. 570,943
Term of patent 14 years
U.S. Cl. D14—63

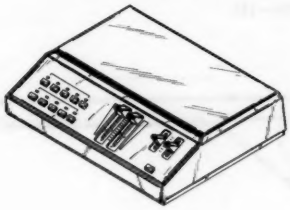
277,379
HANDSET TELEPHONE INSTRUMENT
Kenneth R. Cooke, New York, and Vito L. Porcelli, Ossining, both of N.Y., assignors to AT&T Technologies, Inc., New York, N.Y.
Filed Jan. 16, 1984, Ser. No. 570,945
Term of patent 14 years
U.S. Cl. D14—63



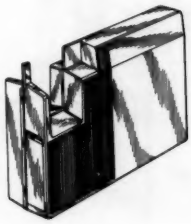
277,380
PORTABLE RADIO RECEIVER
Dieudonne G. Aoijs, Hong Kong, Hong Kong, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 12, 1982, Ser. No. 397,387
Claims priority, application United Kingdom, Jan. 11, 1982, 1004555
Term of patent 14 years
U.S. Cl. D14—70



277,381
VIDEO FADER
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed May 24, 1982, Ser. No. 381,065
Claims priority, application Japan, May 13, 1982,
Term of patent 14 years
U.S. Cl. D14—77



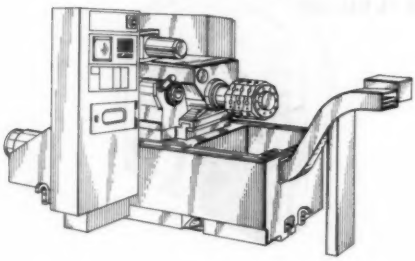
277,382
MAGNETIC CARD OPERATED, MICROPROCESSOR-BASED ACCESS, CYCLE AND TIME-MANAGEMENT CONTROL SYSTEM
Loren A. Schultz, 1617 Kenmare Dr., Dresher, Pa. 19025, and William N. Brownfield, Jr., 234 Wooded Way, Berwyn, Pa. 19312
Filed Mar. 17, 1982, Ser. No. 358,866
Term of patent 14 years
U.S. Cl. D14—105



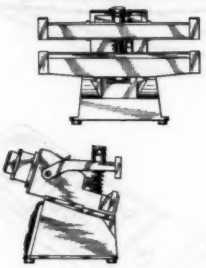
277,383
VIDEO DATA AND GRAPHICS DISPLAY TERMINAL
David E. Boudreau, 294 Lincoln St., Leominster, Mass. 01453; Christian C. Landry, 9 Nash Rd., Acton, Mass. 01720; Duane M. Loose, 78 Leonard Rd., Boxboro, Mass. 01719, and David S. Urbanus, 6 Wichern Rd., South Easton, Mass. 02375
Filed Aug. 9, 1982, Ser. No. 406,676
Term of patent 14 years
U.S. Cl. D14—113

277,384
BAR CODE SCANNING DEVICE
James S. Bianco, 217 S. Brainard Rd., Enfield, Conn. 06082
Filed Sep. 14, 1982, Ser. No. 417,835
Term of patent 14 years
U.S. Cl. D14—116

277,385
TURNING MACHINE
Carl J. Myers, Mentor, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Oct. 18, 1982, Ser. No. 435,003
Term of patent 14 years
U.S. Cl. D15—130

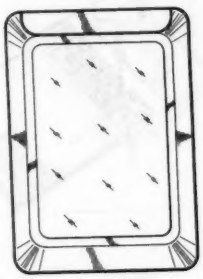


277,386
HEAT SEALING MACHINE
Teruo Yamada, Suita, Japan, assignor to Yugen Kaisha Fuji Seisakusho, Japan
Filed Dec. 17, 1982, Ser. No. 450,679
Claims priority, application Japan, Jun. 18, 1982, 57-27604
Term of patent 14 years
U.S. Cl. D15—146

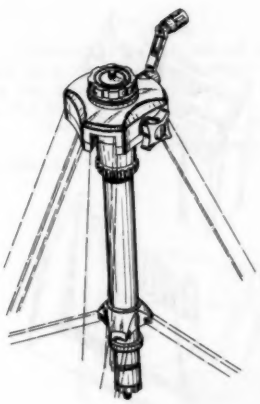


277,387
COMBINED TRANSMISSION AND PROPELLER ASSEMBLY FOR BOATS
Kjell Borgersen, Hjalteby, and Lennart Brandt, Fjaras, both of Sweden, assignors to AB Volvo Penta, Gothenburg, Sweden
Division of Ser. No. 105,242, Dec. 19, 1979, Pat. No. Des. 264,724. This application Sep. 14, 1981, Ser. No. 301,964
Term of patent 14 years
U.S. Cl. D15—149

277,388
PICTURE VIEWER
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest Ag, Chur, Switzerland
Filed Nov. 29, 1982, Ser. No. 445,164
Claims priority, application Switzerland, Jun. 1, 1982, DM/001 515
Term of patent 14 years
U.S. Cl. D16—11



277,389
PAN HEAD MOUNTING ASSEMBLY FOR TRIPOD
Koma Nakatani, Tokyo, Japan, assignor to Velbon Int'l Corporation, Torrance, Calif.
Filed Oct. 22, 1982, Ser. No. 435,999
Term of patent 14 years
U.S. Cl. D16—46



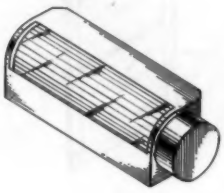
277,390
YOKE FOR AN ENGRAVING APPARATUS
Marvin J. Nissman, Great Neck, N.Y., assignor to New Hermes Incorporated, New York, N.Y.
Filed Jul. 6, 1982, Ser. No. 395,889
Term of patent 14 years
U.S. Cl. D18—22

277,391
PERPETUAL CALENDAR
Helen Mooney, 12 Cherry La., Great Neck, N.Y. 11024
Filed Jul. 26, 1982, Ser. No. 401,890
Term of patent 14 years
U.S. Cl. D19—25

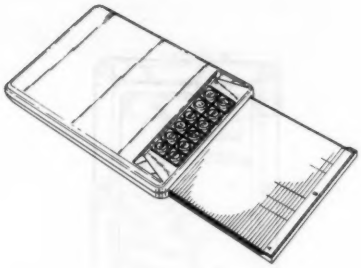
277,392
PEN
Jerome P. Salinger, Roslyn Estates, N.Y., assignor to Jonathan Bradley Pens, Inc., Long Island City, N.Y.
Filed Sep. 30, 1982, Ser. No. 432,543
Term of patent 14 years
U.S. Cl. D19—42

277,393
BALL POINT PEN
Toshiharu Oyabu, Nagoya, Japan, assignor to Shachihata Industry Co., Ltd., Nagoya, Japan
Filed Sep. 13, 1982, Ser. No. 417,133
Claims priority, application Japan, Apr. 9, 1982, 57-15449
Term of patent 14 years
U.S. Cl. D19—51

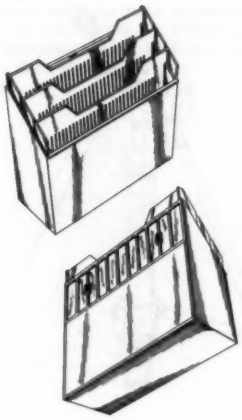
277,394
TELEPHONE INDEX
Michael H. Assels, 4373 Jasmine St., Saginaw, Mich. 48603
Filed Aug. 26, 1982, Ser. No. 411,669
Term of patent 14 years
U.S. Cl. D19—76



277,395
TELEPHONE INDEX
Heiko Ippen, Düsseldorf, Fed. Rep. of Germany, assignor to Confon AG, Rheineck, Switzerland
Filed Sep. 15, 1982, Ser. No. 418,465
Term of patent 14 years
U.S. Cl. D19—76

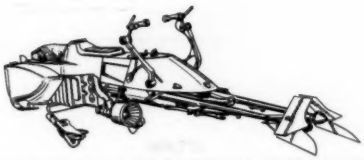


277,396
ORGANIZER FILE
Harry Mahler, Waterloo, Canada, assignor to Esselte Pendaflex Canada Inc., Toronto, Canada
Filed Sep. 8, 1982, Ser. No. 416,038
Claims priority, application Canada, Mar. 12, 1982, 12-03-82-11
Term of patent 14 years
U.S. Cl. D19—90

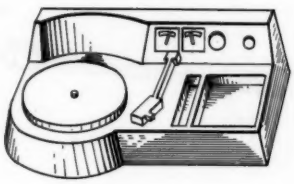


277,397
DRESSMAKER'S BODYFORM
Eric R. Arthur, Norfolk, England, assignor to A. E. Arthur Limited, Norfolk, England
Filed Jun. 1, 1982, Ser. No. 383,832
Term of patent 14 years
U.S. Cl. D20—31

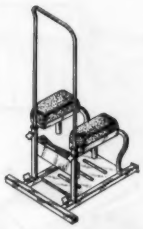
277,398
TOY VEHICLE
Joseph E. Johnston, San Rafael, Calif., assignor to Lucasfilm Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 429,776
Term of patent 14 years
U.S. Cl. D21—87



277,399
PHONOGRAPH OR SIMILAR ARTICLE
Richard C. Levy; Sheryl Levy, both of 6737 Newbold Dr., Bethesda, Md. 20817, and Gary Piaget, 5 Ridley Ct., Glenn Ridge, N.J. 07028
Filed Apr. 28, 1982, Ser. No. 372,703
Term of patent 14 years
U.S. Cl. D21—112



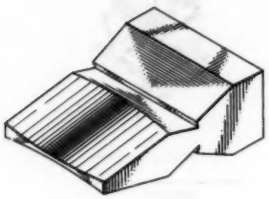
277,400
GYMNASTIC PLATFORM
Syozo Inoue, 84 Yamashita-cho, Naka-ku, Yokohama, Japan
Filed Aug. 9, 1982, Ser. No. 406,635
Term of patent 14 years
U.S. Cl. D21—191



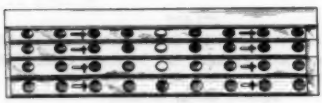
277,401
SKATE BOOT
Rene Bourque, Duvernay, Canada, assignor to Warrington Inc., Montreal, Canada
Filed Jan. 28, 1983, Ser. No. 462,117
Term of patent 14 years
U.S. Cl. D21—225

277,402
FISHING POLE WITH LURE SHOOTING MECHANISM
Nellie Thompson, 2536 Parkdale Dr., Modesto, Calif. 95351
Filed Sep. 7, 1982, Ser. No. 415,368
Term of patent 14 years
U.S. Cl. D22—23

277,403
AIR NOZZLE
Peter M. Wilson, Hayes, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Feb. 5, 1982, Ser. No. 346,198
Claims priority, application United Kingdom, Sep. 12, 1981, 1002467
Term of patent 14 years
U.S. Cl. D23—35

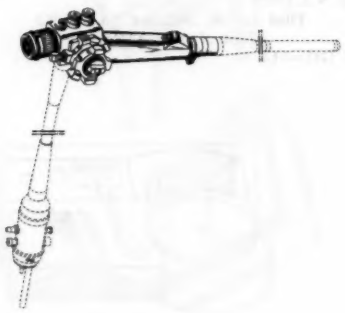


277,404
DEGREASER VENTILATION HOOD
Oscar Peterson, Mt. Clemens, and Richard W. Clement, Milford, both of Mich., assignors to Detrex Chemical Industries, Inc., Southfield, Mich.
Filed May 13, 1982, Ser. No. 377,630
Term of patent 14 years
U.S. Cl. D23—151



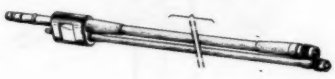
277,405
OPERATING ASSEMBLY OF AN ENDOSCOPE
Michio Imada, Kodaira, Japan, assignor to Olympus Optical Company, Ltd., Japan
Filed Sep. 7, 1982, Ser. No. 415,690
Claims priority, application Japan, Mar. 8, 1982, 57-9421
Term of patent 14 years
U.S. Cl. D24—17

277,406
OPERATING ASSEMBLY OF AN ENDOSCOPE
Michio Imada, Kodaira, Japan, assignor to Olympus Optical Company, Ltd., Japan
Filed Sep. 7, 1982, Ser. No. 415,688
Claims priority, application Japan, Mar. 8, 1982, 57-9423
Term of patent 14 years
U.S. Cl. D24—17

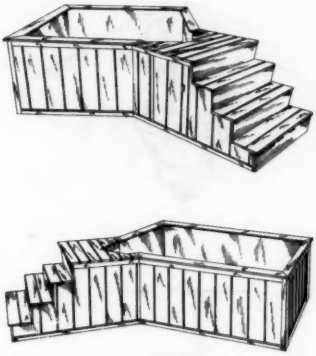


277,407
OPERATING ASSEMBLY OF AN ENDOSCOPE
Michio Imada, Kodaira, Japan, assignor to Olympus Optical Company, Ltd., Japan
Filed Sep. 7, 1982, Ser. No. 415,689
Claims priority, application Japan, Mar. 8, 1982, 57-9422
Term of patent 14 years
U.S. Cl. D24—17

277,408
LIGHT GUIDE FOR ENDOSCOPE
Hiroaki Kubokawa, and Koichiro Ishiwara, both of Hachioji, Japan, assignors to Olympus Optical Company, Ltd., Japan
Filed Sep. 10, 1982, Ser. No. 416,635
Claims priority, application Japan, Mar. 18, 1982, 57-11172
Term of patent 14 years
U.S. Cl. D24—17

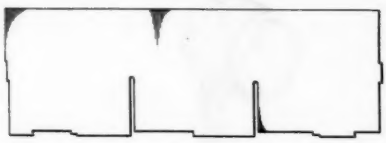


277,409
COMBINED STAIRS AND ENCLOSURE FOR A HYDROTHERAPY SPA
Alfred W. Elsner, and Willard H. Schmitz, both of Plymouth, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Sep. 28, 1982, Ser. No. 426,210
Term of patent 14 years
U.S. Cl. D24—38



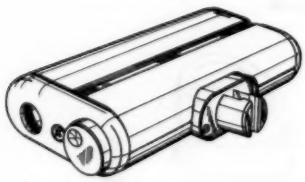
277,410
FEMALE URINAL
Rosalie Floyd, #2 - 900 Fairview Rd., Penticton, British Columbia, Canada V2A 5YB
Filed May 6, 1982, Ser. No. 375,566
Term of patent 14 years
U.S. Cl. D24—54

277,411
SHINGLE
Giuseppe Spinelli, St. Constant, and Peter G. MacDonald, St. Rose, both of Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.
Filed Oct. 28, 1982, Ser. No. 437,257
Claims priority, application Canada, Aug. 3, 1982, 03-08-82-2
Term of patent 14 years
U.S. Cl. D25—80



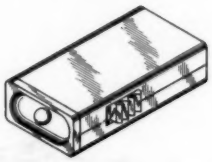
277,412
COMPACT ELECTRIC DISCHARGE LAMP
Denis E. Bedel, Pittsburgh, Pa., assignor to North American Philips Electric Corp., New York, N.Y.
Filed Jul. 26, 1982, Ser. No. 402,192
Term of patent 14 years
U.S. Cl. D26—3

277,413
LIGHTING UNIT FOR FIBER OPTIC SYSTEMS
Jan-Åke Hallén, Brinketorpsvägen 3, S-433 41 Partille, Sweden
Filed Apr. 14, 1982, Ser. No. 368,457
Claims priority, application Sweden, Oct. 16, 1981, 81-2348
Term of patent 14 years
U.S. Cl. D26—27

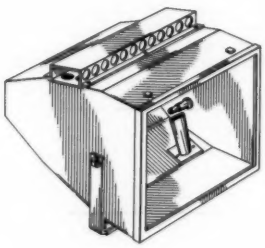


277,414
PORTABLE LAMP
John C. Parker, Tyler; Norman L. Terry, and Bud W. Lester, both of Jacksonville, all of Tex., assignors to Teknovation, Incorporated, Jacksonville, Tex.
Filed Aug. 23, 1982, Ser. No. 410,402
Term of patent 14 years
U.S. Cl. D26—45

277,415
FLASHLIGHT
Robert M. Berger, Warren, Vt., assignor to Intercon Purchasing U.S.A. Ltd., Forest Hills, N.Y.
Filed Aug. 5, 1982, Ser. No. 405,544
Term of patent 14 years
U.S. Cl. D26—46

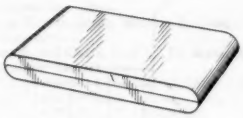


277,416
LUMINAIRE HOUSING
Joseph E. Brown, 116 E. Piping Rock Rd., Phoenix, Ariz. 85022
Filed Feb. 8, 1982, Ser. No. 346,510
Term of patent 14 years
U.S. Cl. D26—63

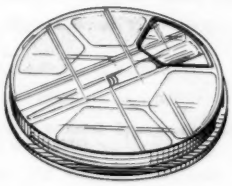


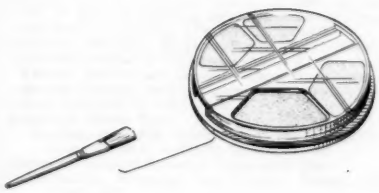
277,417
HAIR DRYER WITH ATTACHMENTS
John Wistrand, New Canaan, Conn., assignor to Clairol Incorporated, New York, N.Y.
Filed Jul. 11, 1980, Ser. No. 167,511
Term of patent 14 years
U.S. Cl. D28—13

277,418
HAIR CURLER SET
William R. Hemrich, Jr., Glen Ellyn, and Bernard B. Bluestein, Des Plaines, both of Ill., assignors to Sunbeam Corporation, Oak Brook, Ill.
Filed Jul. 12, 1982, Ser. No. 397,386
Term of patent 14 years
U.S. Cl. D28—38

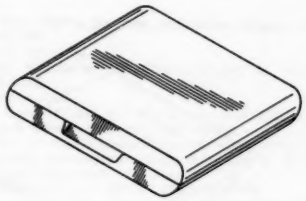


277,419
COSMETIC COMPACT
Eli I. Schefer, Sands Point, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Sep. 13, 1982, Ser. No. 416,801
Term of patent 14 years
U.S. Cl. D28—82





277,420
COSMETIC CASE
Dieter Bakic, Romerstrasse 15, 8000 Munchen 40, Fed. Rep. of Germany
Filed Nov. 22, 1982, Ser. No. 443,291
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 11 AR 1979/82
Term of patent 14 years
U.S. Cl. D28—83



277,421
COSMETIC CASE
Dieter Bakic, Romerstrasse 15, 8000 Munchen 40, Fed. Rep. of Germany
Filed Nov. 22, 1982, Ser. No. 443,294
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 11 AR 1979/82
Term of patent 14 years
U.S. Cl. D28—83

277,422

COSMETIC CASE

Dieter Bakic, Romerstrasse 15, 8000 Munchen 40, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,295

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 11 AR 1979/82

Term of patent 14 years

U.S. Cl. D28—83

277,423

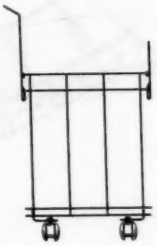
CART FOR PAPER

Beverly C. Rich, 1310 Maywood Ave., Ruxton, Md. 21204

Filed Apr. 15, 1982, Ser. No. 368,794

Term of patent 14 years

U.S. Cl. D34—17



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JANUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A B C Auto Alarms, Inc.: *See*—
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A G Motor Corp.: *See*—
Ezell, James J.; and Garin, Paul V., III, 4,496,188, Cl. 296-190.000.

A. Nattermann & Cie. GmbH: *See*—
Gunther, Bernd-Rainer, 4,496,486, Cl. 260-403.000.

A/S Punes Marine and Offshore Services: *See*—
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AB Carbogel: *See*—
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AB Volvo: *See*—
Nertman, Inge, 4,496,052, Cl. 206-470.000.

Abbott Laboratories: *See*—
Genese, Joseph N.; and Seberg, Charles H., 4,496,348, Cl. 604-167.000.

Abe, Masayuki; Ikoma, Junichi; and Abiko, Kenzi, to Hitachi, Ltd. Disc positioning device. 4,497,003, Cl. 360-97.000.

Abe, Ryozo: *See*—
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Abendroth, Paul: *See*—
Despot, Janko; and Abendroth, Paul, 4,495,863, Cl. 101-350.000.

Abiko, Kenzi: *See*—
Abe, Masayuki; Ikoma, Junichi; and Abiko, Kenzi, 4,497,003, Cl. 360-97.000.

Abrams, John C., to Potters Industries, Inc. Conductive paste, electroconductive body and fabrication of same. 4,496,475, Cl. 252-514.000.

Acker, Loren C.; Taylor, Junius E.; and Minney, Stephen C., to Engineering and Research Associates, Inc. Jaws for an electro-mechanical tubing sealer. 4,496,819, Cl. 219-10.810.

Acker, Rolf-Dieter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Fungicidal thiadiazinones. 4,496,563, Cl. 514-222.000.

Ackerman, John F., to General Electric Company. Photoluminescent phosphors and X-ray imaging systems utilizing such phosphors. 4,496,844, Cl. 250-483.100.

Adachi, Masaaki: *See*—
Maenishi, Kozo; Adachi, Masaaki; and Bando, Yoshihide, 4,496,806, Cl. 200-16.00R.

Adachi, Susumu: *See*—
Kitakami, Hazime; Ishikawa, Hiroshi; Tezuka, Masayoshi; Adachi, Susumu; and Makinouchi, Akifumi, 4,497,039, Cl. 364-900.000.

Adachi, Takashi; Morimoto, Shigeo; Takahashi, Yoko; Watanabe, Yoshiaki; and Omura, Sadafumi, to Taisho Pharmaceutical Co., Ltd. Erythromycin B derivatives. 4,496,717, Cl. 536-7.200.

Adachi, Yasuo; and Nabae, Kiyoyuki, to Toray Industries, Inc. Acrylic fibers for producing carbon fibers. 4,496,631, Cl. 428-394.000.

Adams, Bruce M. Multistate precipitation removal tool. 4,495,668, Cl. 15-105.000.

Adams, Mark J., to Boeing Company, The. Hinge latch. 4,495,672, Cl. 16-229.000.

Adams Plastics: *See*—
Simpson, Roy G., 4,495,752, Cl. 54-24.000.

Adams Plastics, Inc.: *See*—
Simpson, Roy G., 4,495,753, Cl. 54-24.000.

Aderhold, Ronald: *See*—
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Adir: *See*—
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Adolph Coors Company: *See*—
Haake, Joseph R.; Fowler, Tracy J.; and Jensen, James W., 4,496,417, Cl. 156-361.000.

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Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., to Vsesojuzny Nauchno-Issledovatelsky Institut Elektromashinostroenia. Electrical machine. 4,496,868, Cl. 310-112.000.

Afendykiw, Marko: *See*—
Bowling, Donald R.; Kinman, Darry M.; Afendykiw, Marko; and White, David J., 4,497,030, Cl. 364-481.000.

Agency of Industrial Science & Technology: *See*—
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Aichi Machine Industry Company, Limited: *See*—
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Aisan Industry Co., Ltd.: *See*—
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Akiyama, Teruo; and Morita, Koichi, to Kabushiki Kaisha Komatsu Seisakusho. Anticavitation control system for a hydrostatic transmission. 4,495,767, Cl. 60-436.000.

Akutsu, Masao: *See*—
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Albanese, Vincent M., to Nalco Chemical Company. Method for using chemical additives to protect utility boiler air heaters while increasing unit generation capacity. 4,496,525, Cl. 423-242.000.

Albers, Teo, Sr. Cattle stanchion apparatus. 4,495,897, Cl. 119-148.000.

Albert, James W.; and Turner, Weems D., to Baker ProLift, Inc. Reciprocating drive and velocity control for long stroke well pumping unit. 4,496,285, Cl. 417-12.000.

Alet, Robert; and Vignault, Eric, to Thomson-CSF. Force restoration system for the simulation of vehicle driving members. 4,496,323, Cl. 434-29.000.

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Allen-Bradley Company: *See*—
Reichert, Gilbert A.; and Schuette, Donald K., 4,496,791, Cl. 174-51.000.

Allen, Charles B. Eyeglass frame with pocket clip. 4,496,224, Cl. 351-155.000.

Allen, Leslie J., to Raychem Corporation. Paddlecard terminator. 4,496,094, Cl. 228-56.000.

Allen, Ralph E.; and Gibson, Christian D., to Raymond Corporation, The. Material handling apparatus. 4,496,031, Cl. 187-9.00R.

Allen, Robert E.; and Thomasson, James T., to Newport Corporation. Methods and apparatus for translating electric motor rotation into linear travel. 4,496,865, Cl. 310-80.000.

Alles, Hans-Ulrich: *See*—
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Allgeyer, David F., to UMC Industries, Inc. Closure such as a glass door for a refrigeration or freezer. 4,496,201, Cl. 312-296.000.

Allied Corporation: *See*—
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Chang, Irving B.; and Beckwith, Robert E., Jr., 4,496,622, Cl. 428-280.000.

Allis-Chalmers Corporation: *See*—
Gokhman, Alexander, 4,496,282, Cl. 415-161.000.

Almond, Eric A.; and Gee, Mark G. Abrasive bodies. 4,496,372, Cl. 51-309.000.

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Alten, Kurt. Deformable seal of the gap between a building opening and a vehicle driven up to it. 4,495,737, Cl. 52-173.0DS.

Altman, Ted N., to RCA Corporation. Binary drive circuitry for matrix-addressed liquid crystal display. 4,496,219, Cl. 350-332.000.

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American Cyanamid Company: *See—*
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Ammermann, Eberhard: *See—*
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Stubenrauch, Gerd; Ammermann, Eberhard; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,496,738, Cl. 548-262.000.

AMP Incorporated: *See—*
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Andersen, Leonard M. Method for in-situ recovery of energy raw materials by the introduction of cryogenic liquid containing oxygen. 4,495,993, Cl. 166-261.000.

Anderson, Burton C.; England, David C.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Cyclic monomers derived from trifluoropyruvate esters. 4,496,750, Cl. 549-455.000.

Anderson, Clifford W. Translotor log trailer. 4,496,166, Cl. 280-401.000.

Anderson, Kenneth W.: *See—*
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Ando, Takao: *See—*
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Andreasson, Jan Y. N., to EMAB Electrolux Motor Aktiebolag. Choke device. 4,495,911, Cl. 123-198.00R.

Andresen, Bernhard H.; Schenck, Stephen R.; and Kennedy, Nathan R., to Texas Instruments Incorporated. Piezo harn self-oscillating drive circuit. 4,496,914, Cl. 331-110.000.

Android Corporation: *See—*
Rise, William E., 4,496,042, Cl. 198-774.000.

Angeles, Marshall R.: *See—*
Engelhart, John E.; Angeles, Marshall R.; and D'Errico, Michael J., 4,496,581, Cl. 514-438.000.

Annino, Raymond; Cheney, Maynard C.; and Fletcher, Kenneth S., to Foxboro Company, The. Apparatus and method for determining the amount of a sample gas component. 4,496,433, Cl. 204-1.00T.

Ansel, Robert E.; Cutler, Orvid R.; and Moschovis, Elias P., to DeSoto, Inc. Low temperature-flexible radiation-curable unsaturated polysiloxane coated fiber optic. 4,496,210, Cl. 350-96.300.

Ansel, Robert E., to DeSoto, Inc. Radiation-curable coatings containing reactive pigment dispersants. 4,496,686, Cl. 524-850.000.

Antonov, Jury F.; Iogansen, Vadim I.; Tkachenko, Alexei S.; Chernyavsky, Vladimir P.; and Shapiro, Aron B., to Leningradskoe Proizvodstvennoe Elektromachinostroitelnoe Obiedinenie "Elektrosila". Arrangement for supporting stator end windings of an electrical machine. 4,496,870, Cl. 310-260.000.

Aoyagi, Masao, to Canon Kabushiki Kaisha. Actuating device for photographic lens assembly. 4,496,217, Cl. 350-255.000.

Apetrei, Constantin; Nitigus, Victor; Elek, Demeter; Radulescu, Marian; and Sachelaire, Toma, to Research Institute for the Electrotechnical Industry—ICPE. Brake motor. 4,496,864, Cl. 310-77.000.

Appleton Mills: *See—*
Beck, David A., 4,495,680, Cl. 28-100.000.

Applied Materials, Inc.: *See—*
McNeilly, Michael A.; and Benzing, Walter C., 4,496,609, Cl. 427-55.000.

Arai, Nobukatsu; Machida, Shigeru; Sato, Eiji; Tojo, Kenji; and Uchikawa, Naoshi, to Hitachi, Ltd. Device for pressing orbiting scroll member in scroll type fluid machine. 4,496,296, Cl. 418-55.000.

Arai, Nobushige, to Sharp Kabushiki Kaisha. Solar heat collector with joint structure. 4,495,939, Cl. 126-450.000.

Arai, Takao: *See—*
Hoshino, Takashi; and Arai, Takao, 4,497,055, Cl. 371-31.000.

Arakawa, Hideo: *See—*
Yamada, Shunsuke; Kawate, Kenji; Ono, Takashi; Arakawa, Hideo; and Suda, Tsuyoshi, 4,496,312, Cl. 432-11.000.

Arakawa, Satoshi: *See—*
Horikawa, Kazuo; and Arakawa, Satoshi, 4,496,973, Cl. 358-111.000.

Arcas, Agustin A.: *See—*
Jodar, Francisco Y.; and Arcas, Agustin A., 4,495,892, Cl. 119-16.000.

Arena, Blaise J., to UOP Inc. Hydrocracking of polyols. 4,496,780, Cl. 568-861.000.

Armco Inc.: *See—*
Haselkorn, Michael H., 4,496,399, Cl. 148-6.15R.

Armstrong, Donald E., to GTE Products Corporation. Multilamp photoflash array fabrication. 4,496,311, Cl. 431-359.000.

Armstrong World Industries, Inc.: *See—*
Ehrhart, Wendell A.; Lenox, Ronald S.; and Sparks, Moses, Jr., 4,496,674, Cl. 523-500.000.

Arnold, Dan M.: *See—*
Dowling, Donald J.; Richter, Albert P., Jr.; Warren, Wayne F.; and Arnold, Dan M., 4,495,805, Cl. 73-155.000.

Arriola, Arturo: *See—*
Cooke, Michael W.; Arriola, Arturo; Stegman, Julius M.; and Collins, Kenneth D., 4,495,849, Cl. 89-1.140.

Arrow Container & Packaging Corp.: *See—*
Koltun, Harry M., 4,496,054, Cl. 206-586.000.

Arthur D. Little, Inc.: *See—*
DeCloux, Richard J.; Loeffler, Herbert H.; MacConkey, James S.; and Yonkers, E. Hubbard, 4,496,147, Cl. 272-130.000.

Asahi Glass Company, Ltd.: *See—*
Ishii, Tsuneji; Ito, Hiroaki; and Ishikawa, Takamichi, 4,496,451, Cl. 204-252.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, 4,496,505, Cl. 264-101.000.
Yoshida, Mitsuo; and Shiroki, Hiroyuki, 4,496,453, Cl. 204-290.00R.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Machida, Takeshi, 4,496,243, Cl. 356-244.000.

Asai, Yoshimi; Takiguchi, Michitaka; and Horie, Fujio, to Brother Kogyo Kabushiki Kaisha. Electronic sewing machine. 4,495,878, Cl. 112-158.00B.

Asako, Shigeru: *See—*
Okita, Koichi; and Asako, Shigeru, 4,496,507, Cl. 264-127.000.

Asano, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,495,903, Cl. 123-90.380.

Asano, Masamichi: *See—*
Iwahashi, Hiroshi; Asano, Masamichi; Yoshikawa, Kuniyoshi; and Mito, Masazi, 4,495,693, Cl. 29-571.000.

ASEA Aktiebolag: *See—*
Jonsson, Karl E.; and Lindgren, Gosta, 4,496,920, Cl. 335-201.000.
Kollberg, Sten, 4,495,984, Cl. 164-468.000.
Olsson, Ingemar; Ottosson, Goran; and Sinner, Bengt, 4,496,112, Cl. 242-66.000.

Ashby, Bruce A., to General Electric Company. Silicone flame retardants for nylon. 4,496,680, Cl. 524-265.000.

Ashcraft, Charles R.: *See—*
Park, Hee C.; and Ashcraft, Charles R., 4,496,620, Cl. 428-323.000.

Asher, William P.; and Munz, Otto J., deceased (by Munz, Gerta H., executrix). Combined swimming aid and lifesaving device. 4,496,328, Cl. 441-55.000.

Ashland Oil, Inc.: *See—*
Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,496,665, Cl. 502-521.000.

Ashwood, Valerie A.: *See—*
Evans, John M.; and Ashwood, Valerie A., 4,496,565, Cl. 514-222.000.

AT&T Bell Laboratories: *See—*
Tai, King L.; and Vratny, Frederick, 4,496,448, Cl. 204-192.00E.

AT&T Technologies, Inc.: *See—*
Kuyel, Birol, 4,496,425, Cl. 156-626.000.
Nauman, Delbert A., 4,496,432, Cl. 204-1.00T.
Price, John W., 4,496,797, Cl. 179-81.00B.

Atari, Inc.: *See—*
Kramer, Dan H., 4,496,936, Cl. 340-347.00P.

Ateya, Antoun I.; and Lu, Wei C., to Eastman Kodak Company. Electric field adjustment for magnetic brushes. 4,496,644, Cl. 430-122.000.

Atkin, Howard S., to Dunlop Limited. Flexible couplings. 4,496,331, Cl. 464-70.000.

Atlantic Building Systems, Inc.: *See—*
Ellison, Burlan E.; Spranca, Harry P.; and Hooper, Christopher C., 4,495,743, Cl. 52-478.000.

Atlantic Richfield Company: *See—*
Clausius, Richard A., 4,496,533, Cl. 423-448.000.
Lordi, Frank E., 4,496,681, Cl. 524-371.000.
Meyers, Kevin O.; and Skillman, Harry L., Jr., 4,495,996, Cl. 166-279.000.
Ottoson, Javan D., 4,495,710, Cl. 34-10.000.

Atlas Copco Aktiebolag: *See—*
Hansson, Gunnar C., 4,496,164, Cl. 279-19.600.
Lindberg, Eric T.; and Friedman, Anna M., 4,496,023, Cl. 181-230.000.

Atwood, Jerry L., to University of Alabama. Multidentate macromolecular complex salt clathrates. 4,496,744, Cl. 549-208.000.

Audley, Gary J.: *See—*
Campbell, Ian M.; Baulch, Donald L.; and Audley, Gary J., 4,496,783, Cl. 568-947.000.

Augusto, Peter, to Bausch & Lomb Incorporated. Motor control system for motorized ophthalmic instrument. 4,496,225, Cl. 351-234.000.

Augusto, Peter; and Stevens, Donn E., to Bausch & Lomb Incorporated. ANDed motor control system for motorized ophthalmic instrument. 4,496,226, Cl. 351-234.000.

Ausonia Farmaceutici s.r.l.: *See—*
De Vincentiis, Leonardo, 4,496,589, Cl. 514-565.000.

Austin, Richard G.: *See—*
Myers, Richard S.; Michaelson, Robert C.; and Austin, Richard G., 4,496,778, Cl. 568-860.000.
Myers, Richard S.; Michaelson, Robert C.; and Austin, Richard G., 4,496,779, Cl. 568-860.000.

Austin Rover Group Limited: *See—*
Daniel, Neville H.; and Duncan, Hugh M., 4,495,919, Cl. 123-440.000.

Automated Optics, Inc.: *See—*
Clough, John; and Hollidge, Henry H., 4,496,242, Cl. 356-244.000.

AVL AG: *See—*
Marsoner, Hermann; and Ritter, Christoph, 4,496,512, Cl. 264-267.000.

Avl Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H.: *See—*
Eidenbock, Thomas, 4,495,908, Cl. 123-195.00C.

Axenov, Vladimir N.: *See—*
Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., 4,496,868, Cl. 310-112.000.

Ayad, Hafez M.: *See—*
Hodakowski, Leonard E.; and Ayad, Hafez M., 4,496,493, Cl. 260-940.000.

Azuma, Tadashi; Akamatsu, Yoshihiro; Akiyama, Hiroyuki; and Yoshimura, Shohei, to Fujimori Kogyo Co., Ltd.; and Japan Styrene Paper Corporation. Electrical conductive foam beads and molded electrical conductive foamed articles obtained therefrom. 4,496,627, Cl. 428-336.000.

Azypatent AG: *See—*
Mandozzi, Aldo, 4,496,038, Cl. 198-339.000.

B. F. Goodrich Company, The: *See—*
Kapiloff, Anita G.; and Hatch, Randolph T., 4,496,470, Cl. 252-181.000.
Riew, Changkiu K.; and Howard, Frank H., 4,496,692, Cl. 525-112.000.
Yang, Wei-Yeih W.; and Okamoto, Yoshihira, 4,496,514, Cl. 264-328.600.

Baas, Gerardus C. Disc for the protection of the udder of a cow. 4,495,896, Cl. 119-146.000.

Babington, Thomas G. Load shaving system. 4,495,777, Cl. 62-185.000.

Bachman, Robert: *See—*
Walsh, Thomas J.; Bachman, Robert; and Aderhold, Ronald, 4,496,125, Cl. 248-188.000.

Backstrom, Gudrun E.: *See—*
Lindahl, Ulf P. F.; Backstrom, Gudrun E.; and Thunberg, John Y. L., 4,496,550, Cl. 514-54.000.

Baer, Ralph H., to Sanders Associates, Inc. Electro-optical sensor for color television games and training systems. 4,496,158, Cl. 273-312.000.

Bagnulo, Luigi, to Caunned Aktiengesellschaft. Method of corrosion protection. 4,496,444, Cl. 204-148.000.

Bai, Monty W.; and Meyer, Alfred B., to Motorola, Inc. Method for simulating a shock pulse. 4,495,792, Cl. 73-12.000.

Baker, Alan J. Hand-held scraper. 4,495,670, Cl. 15-236.00R.

Baker, Andrew P.: *See—*
Carpenter, Peter E. G.; and Baker, Andrew P., 4,496,916, Cl. 337-6.000.

Baker, James G., to Polaroid Corporation. Compact afocal attachment for use with photographic objectives. 4,496,223, Cl. 350-432.000.

Baker ProLift, Inc.: *See—*
Albert, James W.; and Turner, Weems D., 4,496,285, Cl. 417-12.000.

Balanyk, Thomas E.: *See—*
Sandham, H. James; and Balanyk, Thomas E., 4,496,322, Cl. 433-217.000.

Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F. Electrical conduit with vapor barrier device. 4,496,792, Cl. 174-65.00R.

Ballintubber Enterprises Limited: *See—*
Finan, Michael; Finan, Peter; and Divilly, Michael, 4,495,716, Cl. 37-3.000.

Balthazor, Terry M.: *See—*
Ku, Audrey Y.; Chupp, John P.; and Balthazor, Terry M., 4,496,765, Cl. 564-440.000.

Bando, Satoshi: *See—*
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, 4,496,714, Cl. 528-272.000.

Bando, Yoshihide: *See—*
Maenishi, Kozo; Adachi, Masaaki; and Bando, Yoshihide, 4,496,806, Cl. 200-16.00R.

Banitt, Elden H.: *See—*
McQuinn, Roy L.; Bronn, William R.; and Banitt, Elden H., 4,496,734, Cl. 546-221.000.

Banko, Anton, to Surgical Design Corporation. Surge prevention system for an ophthalmic instrument. 4,496,342, Cl. 604-27.000.

Barcus-Berry, Inc.: *See—*
Crooks, Robert C., 4,496,859, Cl. 307-520.000.

Barkan, Edward: *See—*
Swartz, Jerome; Barkan, Edward; and Harrison, Shelley A., 4,496,831, Cl. 235-472.000.

Barley, Geoffrey W., to UOP Inc. Parallel folding armrest. 4,496,190, Cl. 297-411.000.

Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., to Burroughs Corporation. Conductor composition and devices using it. 4,496,875, Cl. 313-632.000.

Barthel, Alfred: *See—*
Young, John K.; and Barthel, Alfred, 4,495,775, Cl. 62-48.000.

Bartz, Wilfried: *See—*
Zagefka, Hans-Dieter; Bartz, Wilfried; and Konietzny, Alfred, 4,496,613, Cl. 427-440.000.

BASF Aktiengesellschaft: *See—*
Acker, Rolf-Dieter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,496,563, Cl. 514-222.000.
Bergmann, Udo; Dix, Johannes P.; Hansen, Guenter; and Schefczik, Ernst, 4,496,480, Cl. 534-794.000.
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Lucas, Ekhart; Merger, Franz; and Nees, Friedbert, 4,496,770, Cl. 568-463.000.
Greif, Norbert; Oppenlaender, Knut; Hettche, Albert; and Vamvakaris, Christos, 4,496,439, Cl. 204-55.00R.
Hambrecht, Juergen; Reffert, Rudi W.; Echte, Adolf; and Swoboda, Johann, 4,496,679, Cl. 524-111.000.
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, 4,496,391, Cl. 71-92.000.
Stubenrauch, Gerd; Ammermann, Eberhard; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,496,738, Cl. 548-262.000.

BASF Farben & Fasern AG: *See—*
Hille, Hans-Dieter; and Harten, Rolf, 4,496,675, Cl. 524-77.000.

BASF Farben & Fasern A.G.: *See—*
Batzill, Wolfgang; and Diefenbach, Horst, 4,496,672, Cl. 523-404.000.

BASF Wyandotte Corporation: *See—*
Camp, Ronald L.; Dexheimer, Edward M.; and Thir, Basil, 4,496,632, Cl. 428-395.000.

Batzill, Wolfgang; and Diefenbach, Horst, to BASF Farben & Fasern A.G. Process for coating an electrically conductive substrate. 4,496,672, Cl. 523-404.000.

Bauer, Dennis P., to Ethyl Corporation. Process for preparing amino acid esters. 4,496,756, Cl. 560-41.000.

Bauer, Helmut: *See—*
Krob, Erwin; Leichtfried, Friedrich; and Bauer, Helmut, 4,496,167, Cl. 280-605.000.

Bauer, James J.; and Strautins, Vilnis, to Clark Equipment Company. Adjustable steering column. 4,495,834, Cl. 74-493.000.

Bauer, Jean-Michel: *See—*
Hubert, Jean-Marie; Bauer, Jean-Michel; and Mollet, Serge, 4,496,621, Cl. 428-236.000.

Bauer, Wilfried; and Pless, Janos, to Sandoz Ltd. Polypeptides, processes for their production, pharmaceutical compositions comprising said polypeptides and their use. 4,496,543, Cl. 514-11.000.

Baulch, Donald L.: *See—*
Campbell, Ian M.; Baulch, Donald L.; and Audley, Gary J., 4,496,783, Cl. 568-947.000.

Baumeister, Manfred; and Edel, Eugen, to MD-Verwaltungsellschaft Nicolaus GmbH & Co. KG. Process for the continuous extraction of vegetable-fiber material in two stages. 4,496,426, Cl. 162-19.000.

Bausch & Lomb Incorporated: *See—*
Augusto, Peter, 4,496,225, Cl. 351-234.000.
Augusto, Peter; and Stevens, Donn E., 4,496,226, Cl. 351-234.000.

Baxter Travenol Laboratories, Inc.: *See—*
Soika, Emil H., 4,496,352, Cl. 604-263.000.
Stone, Albert; Pyde, Edwin; and Carveth, Peter, 4,496,046, Cl. 206-219.000.

Bay, William P. Helmet shield apparatus. 4,495,657, Cl. 2-10.000.

Bayer Aktiengesellschaft: *See—*
Bonse, Gerhard; Marzolph, Gerhard; and Blank, Heinz U., 4,496,736, Cl. 546-327.000.
Hoppe, Dieter; and Kleemann, Heinz-Werner, 4,496,723, Cl. 544-90.000.
Kopp, Richard; Grogler, Gerhard; Reiff, Helmut; and Dieterich, Dieter, 4,496,491, Cl. 260-453.0AR.
Kuhle, Engelbert; Brandes, Wilhelm; Rosslenbroich, Hans-Jurgen; and Klauke, Erich, 4,496,575, Cl. 514-390.000.

Le Blanc, Helmut; and Wedemeyer, Karlfried, 4,496,763, Cl. 564-402.000.
Raue, Roderich, 4,496,719, Cl. 548-455.000.
Redeker, Detmar; and Mrotzek, Dieter, 4,496,340, Cl. 494-29.000.
Skipka, Guido; Alles, Hans-Ulrich; Randau, Gert; and Niese, Manfred, 4,496,764, Cl. 564-418.000.

Bazes, Mel, to Intel Corporation. Integrated circuit synchronous delay line. 4,496,861, Cl. 307-602.000.

BBC Brown, Boveri & Company, Limited: *See*—
Horler, Hansulrich; and Koller, Rudolf, 4,496,252, Cl. 384-215.000.

BCIRA: *See*—
Morley, John G., 4,495,980, Cl. 164-16.000.

Beasley, Roy D.; and LaGrone, James H., to Mobil Oil Corporation. Method of monitoring the growth of cuttings beds in angled well bores. 4,495,803, Cl. 73-151.000.

Beasom, James D., to Harris Corporation. Method of fabricating an isolated gate JFET. 4,495,694, Cl. 29-571.000.

Beaudet, Leo A.; and Lennon, Donald J., to Dennison Manufacturing Company. Anodized electrostatic imaging surface. 4,496,236, Cl. 355-3.0DR.

Bebenkowski, Krzysztof: *See*—
Krecisz, Maria; Kotlewski, Witold; and Bebenkowski, Krzysztof, 4,496,930, Cl. 338-26.000.

Beck, David A., to Appleton Mills. Method and apparatus for forming a helical wound substrate composed solely of longitudinal yarns. 4,495,680, Cl. 28-100.000.

Beck, Hubert W.: *See*—
Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,496,665, Cl. 502-521.000.

Beck, Martin H.; and Krishnakumar, Suppayan M., to Continental Group, Inc., The. Blow molded container and method of forming the same. 4,496,064, Cl. 215-1.00C.

Becker, Wilfried: *See*—
Winkler, Gert; Becker, Wilfried; and Zielinski, Erich, 4,495,852, Cl. 89-46.000.

Beckmann, Friedrich K.; Helzel, Thomas; and Peemoller, Horst, to U.S. Philips Corporation. Device for high voltage transfer between two parts which are rotatable relative to each other. 4,496,202, Cl. 339-5.00R.

Beckwith, Elaine C.: *See*—
Ezis, Andre; Beckwith, Elaine C.; and Blair, Howard D., 4,496,503, Cl. 264-56.000.

Beckwith, Robert E., Jr.: *See*—
Chang, Irving B.; and Beckwith, Robert E., Jr., 4,496,622, Cl. 428-280.000.

Bedu, Marcel; Farcy, Jean C.; and Goin, Christian, to Commissariat a l'Energie Atomique. Flash tube having coax cable connector. 4,496,873, Cl. 313-231.710.

Beecham Group p.l.c.: *See*—
Evans, John M.; and Ashwood, Valerie A., 4,496,565, Cl. 514-222.000.

Beecher, William H.: *See*—
Hall, Kenneth F.; and Beecher, William H., 4,496,355, Cl. 604-327.000.

Beetstra, Tsjalling, to U.S. Philips Corporation. Method and device for writing a data block into a record carrier body. 4,497,050, Cl. 369-59.000.

Beggs, George; and Richardson, Thomas H. Flossing device. 4,495,957, Cl. 132-92.00A.

Beghin-Say S.A.: *See*—
Pigneul, Raymond, 4,496,359, Cl. 604-387.000.

Behr, Friedrich; Schulten, Rudolf; and Weirich, Walter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Diffusion membrane and process for separating hydrogen from gas mixture. 4,496,373, Cl. 55-16.000.

Bell, Christy W.: *See*—
Titus, Charles H.; Wittle, John K.; and Bell, Christy W., 4,495,990, Cl. 166-65.00R.

Bell, Frank H., to Thiokol Corporation. External tracer for gun launched projectiles. 4,495,870, Cl. 102-511.000.

Bell & Howell: *See*—
Guzik, Rudolph, 4,496,232, Cl. 355-3.0CH.

Bell, Malcolm R.: *See*—
Schlegel, Donald C.; and Bell, Malcolm R., 4,496,590, Cl. 514-646.000.

Beloit Corporation: *See*—
Justus, Edgar J., 4,495,711, Cl. 34-23.000.
Justus, Edgar J., 4,495,712, Cl. 34-52.000.

Belyaeva, Svetlana A.: *See*—
Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., 4,496,868, Cl. 310-112.000.

Bender, Franz; Hertweck, Gernot; Grohn, Michael; and Moser, Peter, to Daimler-Benz AG. Valve guide arrangement for the valve stem of a valve in an internal combustion engine. 4,495,906, Cl. 123-188.0GC.

Bendix Corporation, The: *See*—
Kwon, Ki C.; and Luther, Thomas A., 4,496,195, Cl. 308-6.00C.
Kwon, Ki C., 4,496,197, Cl. 308-6.00C.

Bendrick, Charles J.: *See*—
Plotkin, George M.; Bendrick, Charles J.; and Wolf, George, 4,496,539, Cl. 424-94.000.

Bennett, Robert A. Educational game. 4,496,327, Cl. 273-249.000.

Bennewitz, Paul F. Apparatus and method for producing and using directional, electrical and magnetic fields. 4,495,953, Cl. 128-789.000.

Bennitt, Robert A., to Ingersoll-Rand Company. Unidirectional-flow fluid valve. 4,495,964, Cl. 137-512.100.

Benscoter, Richard D., to Butler Manufacturing Company. Underfloor junction box. 4,496,067, Cl. 220-3.700.

Bentz, Joseph W., to Precision Timer Co., Inc. Ignition control circuit for a boiler system. 4,496,305, Cl. 431-1.000.

Benzing, Walter C.: *See*—
McNeilly, Michael A.; and Benzing, Walter C., 4,496,609, Cl. 427-55.000.

Berendt, Hans-Ulrich: *See*—
Schafer, Paul; and Berendt, Hans-Ulrich, 4,496,472, Cl. 252-186.220.

Berger, Terry A., to Hewlett-Packard Company. Self cleaning electrochemical detector and cell for flowing stream analysis. 4,496,454, Cl. 204-402.000.

Bergmann, Udo; Dix, Johannes P.; Hansen, Guenter; and Schefczik, Ernst, to BASF Aktiengesellschaft. Isothiazolazo dyes having coupling components which are free from unsaturated aliphatic radicals. 4,496,480, Cl. 534-794.000.

Bergstedt, Lowell C. Child's growth measuring and registering devices. 4,495,702, Cl. 33-169.00R.

Bergstein, Wolfgang; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, to Degussa Aktiengesellschaft. Catalysts for the production of 2-cyanopyrazine. 4,496,729, Cl. 544-336.000.

Berlant, Emmanuel. 360 Degree radial reflex orthospectral horn for high-frequency loudspeakers. 4,496,021, Cl. 181-152.000.

Berlin, J. Burton, to Boeing Company, The. Control surface lock for flutter constraint. 4,496,121, Cl. 244-75.00A.

Bernfeld, Kenneth G. Adaptors for a collet chuck. 4,496,163, Cl. 279-1.00A.

Bernstein, Lawrence S.; Bien, Fritz; and Jamieson, John A., to Spectral Sciences Incorporated. System and method for remote detection and identification of chemical species by laser initiated nonresonant infrared spectroscopy. 4,496,839, Cl. 250-341.000.

Berol Kemi AB: *See*—
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,496,367, Cl. 44-51.000.

Berry, David J.: *See*—
Stoeckli, Oscar W.; and Berry, David J., 4,496,596, Cl. 426-388.000.

Berthold, Rainer: *See*—
Koerner, Hans-Gerhard; Lang, Helmut; Berthold, Rainer; Strietzel, Rainer; and Melchior, Friedrich, 4,495,851, Cl. 89-6.500.

Beschke, Helmut: *See*—
Bergstein, Wolfgang; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,496,729, Cl. 544-336.000.

Best Lock Corporation: *See*—
Best, Walter E.; and Foshee, William R., 4,496,178, Cl. 292-169.130.

Best, Walter E.; and Foshee, William R., to Best Lock Corporation. Extended latch tube assembly. 4,496,178, Cl. 292-169.130.

Bettin, Leonard A.: *See*—
Frase, Roland J.; and Bettin, Leonard A., 4,496,004, Cl. 172-311.000.

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Lai, John T., 4,496,772, Cl. 568-704.000.

Bhattacharyya, Alakananda: *See*—
Shore, Sheldon G.; and Bhattacharyya, Alakananda, 4,496,532, Cl. 423-417.000.

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Harvey, Peter, 4,496,212, Cl. 350-96.200.

Biegelsen, David K.; and Sirkin, Eric R., to Xerox Corporation. P-Glass reflow technique. 4,496,608, Cl. 427-53.100.

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Big Jon, Inc.: *See*—
Emory, John E., Jr., 4,495,721, Cl. 43-21.200.

Billet, Gilles: *See*—
Fournier, Andre; and Billet, Gilles, 4,496,919, Cl. 335-5.000.

Billing, Lars. Arrangement in apparatus for mechanical nailing. 4,496,092, Cl. 227-149.000.

Billings, William G., to Phillips Petroleum Company. Zinc oxide-char gasification process. 4,496,370, Cl. 48-197.00R.

Binder, Adam. Device for harnessing wind energy including shock absorber. 4,496,848, Cl. 290-55.000.

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Kim, Sun K., 4,496,540, Cl. 514-19.000.

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Kurtz, Robert J.; and LiCausi, Joseph, 4,495,943, Cl. 128-80.00A.

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Sweeney, Charles T.; and Bird, John K., 4,496,441, Cl. 204-98.000.

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Colles, Joseph H.; and Bixby, James A., 4,496,995, Cl. 360-9.100.
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Quittkat, Wolfram; Reuter, Gerhard; and Schmidt, Rudiger, 4,496,313, Cl. 432-14.000.
Black, Arthur G.; Dodge, John H.; and Ernst, Larry M., to International Business Machines Corporation. Bang-bang dual-mode integral controller with proportional control output useful for temperature control. 4,496,829, Cl. 219-497.000.
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Phelps, Richard W., 4,495,886, Cl. 118-249.000.
Blackbourn, Inc.: *See*—
Sykes, Philip K., 4,496,048, Cl. 206-387.000.
Blackwell, Joseph T., III; and Gasper, Larry, III, to Ciba-Geigy Corporation. Method for the production of 2-isopropyl-4-methyl-6-hydroxypyrimidine. 4,496,728, Cl. 544-319.000.
Blad, Leiv H.: *See*—
Zsolnay, Andrew; Perkins, Kelly M.; and Blad, Leiv H., 4,496,697, Cl. 526-60.000.
Blair, Howard D.: *See*—
Ezis, Andre; Beckwith, Elaine C.; and Blair, Howard D., 4,496,503, Cl. 264-56.000.
Blair, Timothy T.: *See*—
Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., 4,496,233, Cl. 355-3.0TR.
Blank, Heinz U.: *See*—
Bonse, Gerhard; Marzolph, Gerhard; and Blank, Heinz U., 4,496,736, Cl. 546-327.000.
Blankenship, Ernest B., to Research Products/Blankenship Corporation. Incinerator for burning odor forming materials. 4,495,873, Cl. 110-250.000.
Blanquaert, Daniel, to Ceraver. Titanium or titanium alloy pin for cement-free fixing in a long bone to form a prosthesis. 4,495,664, Cl. 3-1.913.
Blaser, Eugene M.; Chung, Paul W.; and Varshney, Ramesh C., to International Business Machines Corporation. Low power clock generator. 4,496,852, Cl. 307-269.000.
Blatt, Leland F. Power operated clamp. 4,496,138, Cl. 269-32.000.
Blease, Wilfred J., to Pioneer Plastics, Inc. Container assembly. 4,496,068, Cl. 220-4.00D.
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Heater, Paul L., Jr.; Bletso, Nelson C.; and Tung, William C. T., 4,496,673, Cl. 523-458.000.
Blewett, Charles W.; and Sublett, Michael D., to National Distillers and Chemical Corporation. Process for the metathesis of alkenyl esters. 4,496,758, Cl. 560-112.000.
Blue Circle Industries PLC: *See*—
Vas, Gerson M. F.; and Shiel, Leslie E., 4,496,670, Cl. 523-205.000.
BMC Industries, Inc.: *See*—
Frohlich, Sigurd; and Morris, James V., 4,496,420, Cl. 156-643.000.
BNF Metals Technology Centre: *See*—
Bowers, John E., 4,496,394, Cl. 75-63.000.
Bob Mann & Associates Incorporated: *See*—
Mann, Robert N., 4,496,823, Cl. 219-137.410.
Bock, Klaus: *See*—
Raasch, Hans; Grecksch, Hans; and Bock, Klaus, 4,496,110, Cl. 242-35.50A.
Boda, James C., to Brunswick Corporation. Selectively disengageable, tiller actuated vane steering system. 4,496,326, Cl. 440-62.000.
Bodor, Nicholas S., to Key Pharmaceuticals, Inc. 4,5αEpoxymorphinan-6-spiro-2'-(4'-carboxy,1',3'-thiazolidine)derivatives. 4,496,570, Cl. 514-282.000.
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Lill, Helmut; Schrenk, Jurgen; and Wunderwald, Peter, 4,496,653, Cl. 435-7.000.
Boeing Company, The: *See*—
Adams, Mark J., 4,495,672, Cl. 16-229.000.
Berlin, J. Burton, 4,496,121, Cl. 244-75.00A.
Ritter, James D., 4,496,412, Cl. 156-157.000.
Boella, Marcello; and Rivera, Paolo, to Ing. C. Olivetti & C., S.p.A. Shaft encoder with diffusely placed light sensitive elements. 4,496,835, Cl. 250-231.0SE.
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Bondar, Efim S.: *See*—
Nikolsky, Vladimir A.; Yagodin, Valery M.; Vazhnov, Evgeny N.; Bondar, Efim S.; Naumenko, Igor P.; Vozny, Valery F.; Orlov, Vladimir N.; and Tikhonov, Vladimir I., 4,495,776, Cl. 62-114.000.
Bonnin, Michelle; Musikas, Claude; and Vitorge, Pierre, to Commissariat a l'Energie Atomique. Process for separating the actinides and lanthanides present in the trivalent state in an acid aqueous solution. 4,496,523, Cl. 423-9.000.
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Booth, Raymond E.; and Miller, Michael E., to Sam Stein Associates, Inc. Breading machine. 4,496,084, Cl. 222-282.000.
Bopp, Warren G., to Eaton Corporation. Viscous coupling for torque converter bypass. 4,496,034, Cl. 192-3.280.
Borch, Michael J.: *See*—
Faust, James H.; and Borch, Michael J., 4,496,809, Cl. 200-61.45R.
Borg-Warner Chemicals, Inc.: *See*—
Grant, Thomas S.; and Myers, Charles L., 4,496,690, Cl. 525-66.000.
Borner, Roland; Holstein, Herbert; and Sennewald, Jurgen, to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH & Co. KG. Scanning finger for a scanning device of a machine for the automatic sharpening of broaching or reaming tools. 4,495,733, Cl. 51-165.00R.
Borovsky, Simcha: *See*—
Hillel, Arie; and Borovsky, Simcha, 4,496,351, Cl. 604-250.000.
Borsuk, Leslie M., to International Telephone and Telegraph Corporation. Audible indicator for a connector. 4,496,213, Cl. 350-96.220.
Borthwick, Alan D.: *See*—
Crame, Andrew J.; and Borthwick, Alan D., 4,496,579, Cl. 514-411.000.
Bosch-Siemens Hausgeraete GmbH: *See*—
Farber, Karlheinz; and Nelzow, Hartmann, 4,496,080, Cl. 222-129.300.
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Nelzow, Hartmann; Karlheinz, Farber; and Deininger, Anton, 4,496,078, Cl. 222-87.000.
Bostian, Bruce R.: *See*—
McGaughey, Donald C.; and Bostian, Bruce R., 4,496,185, Cl. 296-106.000.
Bott, David C.; Edwards, John H.; and Feast, William J., to British Petroleum Company p.l.c., The. Polyacetylene production. 4,496,702, Cl. 526-285.000.
Bourgogne, Michel; Guth, Jean-Louis; Szabo, Georges; and Wey, Raymond, to Compagnie Francaise de Raffinage. Process for the preparation of zeolite ZK 5. 4,496,528, Cl. 423-328.000.
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Bowers, John E., to BNF Metals Technology Centre. Continuous method of removing tin from lead. 4,496,394, Cl. 75-63.000.
Bowling, Donald R.; Kinman, Darry M.; Afendykiw, Marko; and White, David J., to United States of America, Navy. N-way summing network characterization system. 4,497,030, Cl. 364-481.000.
Bowthorpe-Hellermann Limited: *See*—
Walker, John G., 4,495,972, Cl. 140-93.200.
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Akhavein, Ali A.; and Braithwaite, Gavin B., 4,495,898, Cl. 119-156.000.
Brandes, Wilhelm: *See*—
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Brandt, Joachim; Deblitz, Gerhard; Post, Jurgen; Willimczik, Bernd; Marten, Rolf; Paschen, Rolf; and Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Drawing pen exchanger for computer controlled drawing machines. 4,496,958, Cl. 346-139.00R.
Brandyberry, Dennis R.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Manufacture of metallic cable. 4,495,759, Cl. 57-58.520.
Braschel, Volker; Emig, Reiner; Leiber, Heinz; Mendel, Michael; and Gerstenmeier, Jurgen, to Robert Bosch GmbH. Anti-wheel-lock control system. 4,497,026, Cl. 364-426.000.
Bratton, Ronald E., to Lincoln Manufacturing Company, Inc. Food steam heating apparatus. 4,495,932, Cl. 126-20.000.
Braude, Ruvim: *See*—
Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., 4,496,875, Cl. 313-632.000.
Braun, Leon, to Sebrn Corporation. Parallel serial controller. 4,497,041, Cl. 364-900.000.
Braxmeier, Hans: *See*—
Stahlecker, Fritz; and Braxmeier, Hans, 4,495,758, Cl. 57-19.000.
Brede, Uwe; Hubsch, Gunter; and Stahlmann, Rudolf, to Dynamit Nobel Aktiengesellschaft. Flash guide tube arrangement for propellant charge igniters. 4,495,866, Cl. 102-202.000.
Brems, John H. Workpiece transfer mechanism. 4,496,280, Cl. 414-749.000.
Bridgestone Tire Company Limited: *See*—
Makino, Shigeo; and Sugimura, Noboru, 4,495,976, Cl. 152-354.00R.
Briggs, James E., Jr.; Chu, Kwang-Ho; and Chung, Daniel C., to Allied Corporation. Stabilized fluoropolymer composition. 4,496,677, Cl. 524-108.000.
Brisson, Alfred; and Nowacki, Christopher, to Trutek Research, Inc. Inhalation therapy apparatus. 4,495,944, Cl. 128-725.000.
Brissonneau et Lotz Marine: *See*—
Dantan, Olivier, 4,495,824, Cl. 73-862.640.
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Bott, David C.; Edwards, John H.; and Feast, William J., 4,496,702, Cl. 526-285.000.
British Telecommunications: *See*—
Thorpe, William, 4,496,918, Cl. 333-164.000.
Brittain, Perry N.; and Kirkpatrick, John D. Process for lining high pressure pipeline. 4,496,499, Cl. 264-36.000.
Brittin, Craig E.: *See*—
Reynolds, Michael G.; and Brittin, Craig E., 4,496,818, Cl. 219-10.570.
Britzke, Ingo; and Dilcher, Dietmar, to Gebr. Bode & Co. GmbH. Pivotable sliding door for vehicles. 4,495,729, Cl. 49-212.000.

Brock, Knute K.: *See*—
Sagaser, Thomas M.; Kuhn, Patrick; and Brock, Knute K., 4,495,770, Cl. 60-486.000.

Brockway Engineering Company Limited: *See*—
Wooldridge, Lawson C., 4,496,043, Cl. 198-827.000.

Bronn, William R.: *See*—
McQuinn, Roy L.; Bronn, William R.; and Banitt, Elden H., 4,496,734, Cl. 546-221.000.

Brooks, Samuel C.; and Horwitz, Jerome P., to Wayne State University. Compounds and compositions for inhibiting estrogen sulfotransferase transferase activity, process and novel intermediates therein. 4,496,555, Cl. 514-182.000.

Bross, Robert. Handgun magazine with pommel base. 4,495,720, Cl. 42-7.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Asai, Yoshimi; Takiguchi, Michitaka; and Horie, Fujio, 4,495,878, Cl. 112-158.00B.

Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, to Texaco Inc. Thermal injection and in situ combustion process for heavy oils. 4,495,994, Cl. 166-261.000.

Brown, Boveri & Cie AG: *See*—
Koerner, Hans-Gerhard; Lang, Helmut; Berthold, Rainer; Strietzel, Rainer; and Melchior, Friedrich, 4,495,851, Cl. 89-6.500.

Brown, Paul, to Husky Injection Molding Systems Inc. Apparatus for molding plastic articles. 4,496,302, Cl. 425-547.000.

Brown, Thomas H.; and Ife, Robert J., to Smith Kline & French Laboratories Limited. Phenyl alkylaminopyrimidones. 4,496,567, Cl. 514-272.000.

Brucks, Anton B. Apparatus for vaginal medication application. 4,496,341, Cl. 604-14.000.

Brunn, Oswald. Device for the connection of two struts by inserting a support between and vertically to them. 4,496,260, Cl. 403-189.000.

Brunner, Rudolf, to Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co., KG. Flow divider. 4,495,961, Cl. 137-101.000.

Brunswick Corporation: *See*—
Boda, James C., 4,496,326, Cl. 440-62.000.
Kreft, John R.; and Moss, Elvis W., 4,496,115, Cl. 242-84.10R.

Bruynes, Cornelis A.; and Jurriens, Theodorus K., to Gist-Brocades N.V. Preparation of thioethers. 4,496,720, Cl. 544-29.000.

Budris, John P.: *See*—
Ritter, Thomas A.; Kaganov, Alan L.; and Budris, John P., 4,496,446, Cl. 204-159.140.

Bugatto, Henry, Jr., to Xerox Corporation. Stepper motor controller. 4,496,892, Cl. 318-696.000.

Bujack, Alvin: *See*—
Desai, Ashvin D.; and Bujack, Alvin, 4,496,463, Cl. 210-341.000.

Bull, Garland. Low pressure heating system. 4,496,099, Cl. 237-7.000.

Bullock, Joseph J., III, to Three Sisters Ranch Enterprises PTRs. Neck finish for plastic containers. 4,496,066, Cl. 215-320.000.

Burandt, Corliss O., to Investment Rarities, Incorporated. Mechanism for variably controlling an internal combustion engine valve. 4,495,902, Cl. 123-90.160.

Burgher, Peter H.; and Marsden, Raymond F., to Marelco Power Systems, Inc. Transformer for robot arms. 4,496,821, Cl. 219-116.000.

Burroughs Corporation: *See*—
Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., 4,496,875, Cl. 313-632.000.
Paulinski, Ronald A., 4,496,903, Cl. 324-158.00F.

Burton, Richard J.: *See*—
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Burzin, Klaus: *See*—
Horlbeck, Gernot; and Burzin, Klaus, 4,496,713, Cl. 528-272.000.

Bush, J. Finley; and The, Paul J., to Aluminum Company of America. Process for the removal of sodium oxalate compounds from Bayer spent liquor. 4,496,524, Cl. 423-122.000.

Butler Manufacturing Company: *See*—
Benscoter, Richard D., 4,496,067, Cl. 220-3.700.

Buysse, Henri: *See*—
Gottlieb, Michael M.; Fishman, David S.; and Buysse, Henri, 4,497,012, Cl. 361-306.000.

Byars, Larry W.; and Jackson, Eric C., to Tranoco, Inc.; and Dunlop Sports Company, div. Dunlop Tire and Rubber Corp. Method of making a golf club. 4,496,421, Cl. 156-304.100.

Byding, Otto; and Stroberg, Rolf, to ITT Industries, Inc. Method and a device for lifting and lowering of a load. 4,496,181, Cl. 294-78.00R.

Byers, Charles L., to University of California, The Regents of the. Surgically implantable disconnect device. 4,495,917, Cl. 128-419.00R.

Bynum, Colonel N. Rock gathering apparatus. 4,496,003, Cl. 171-63.000.

Byrd, David A.; and Byrd, Max R. Truck cap. 4,496,184, Cl. 296-100.000.

Byrd, Max R.: *See*—
Byrd, David A.; and Byrd, Max R., 4,496,184, Cl. 296-100.000.

Caille, Michel, to Laiteris Hubert Triballat. Rolled cheese and process for producing the same. 4,496,593, Cl. 426-89.000.

Call, Daniel D.: *See*—
Fethke, Wayne G.; and Call, Daniel D., 4,495,696, Cl. 30-138.000.

Calma Company: *See*—
Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, 4,496,944, Cl. 340-723.000.

Camco, Incorporated: *See*—
Pringle, Ronald E., 4,495,998, Cl. 166-321.000.

Cameron Iron Works, Inc.: *See*—
McEver, James P.; and Lewandowski, James, 4,496,162, Cl. 277-9.500.

Camp, Ronald L.; Dexheimer, Edward M.; and Thir, Basil, to BASF Wyandotte Corporation. Process for lubricating synthetic fibers. 4,496,632, Cl. 428-395.000.

Campbell, Graeme R., to Lucas Industries Limited. Control system for a d.c. motor. 4,496,888, Cl. 318-284.000.

Campbell, Ian M.; Baulch, Donald L.; and Audley, Gary J., to Interox Chemicals Limited. Nitration of organic compounds and organic nitrogen compounds produced. 4,496,783, Cl. 568-947.000.

Campbell, John R.: *See*—
Florence, Robert A.; Campbell, John R.; and Williams, Robert E., Jr., 4,496,705, Cl. 528-34.000.

Campbell, Kent D.; Gulbenkian, Aylin H.; Edamura, Fred Y.; and Kyriacou, Demetrios, to Dow Chemical Company, The. Oxidation of hydrophobic —CH_2OH compounds at oxidized nickel anodes. 4,496,440, Cl. 204-78.000.

Campbell, Robert W.: *See*—
Nimer, Edward L.; and Campbell, Robert W., 4,496,659, Cl. 501-140.000.

Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence: *See*—
Yazar, M. Nihat, 4,496,901, Cl. 324-95.000.

Canada, Robert O.: *See*—
Schoenig, Frederick C., Jr.; Grossman, Leonard N.; Lai, Ching C.; Masaitis, William; and Canada, Robert O., 4,496,056, Cl. 209-539.000.

Canadian General Electric Company Limited: *See*—
Eastcott, Peter D.; and Trussler, Ronald C., 4,496,883, Cl. 318-98.000.

Canadian Patents & Development Limited: *See*—
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinivasa, 4,496,502, Cl. 264-41.000.

Candela Corporation: *See*—
Rice, Benjamin M., 4,497,018, Cl. 363-96.000.

Canon Kabushiki Kaisha: *See*—
Aoyagi, Masao, 4,496,217, Cl. 350-255.000.
Harigaya, Isao; Tamura, Shuichi; Matsuda, Mutsuhide; Hirohata, Michio; Ito, Fumio; and Taguchi, Tetsuya, 4,496,227, Cl. 354-289.120.
Haruta, Masahiro; and Hamamoto, Takashi, 4,496,629, Cl. 428-341.000.
Isohata, Junji; and Sato, Mitsuya, 4,496,239, Cl. 355-30.000.
Kashiwagi, Kazuo; and Shirai, Masanari, 4,496,117, Cl. 242-191.000.
Kobayashi, Makoto, 4,496,891, Cl. 318-696.000.
Ohta, Masakatu, 4,497,013, Cl. 362-32.000.
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,496,832, Cl. 250-201.000.
Takimoto, Hiroyuki, 4,496,998, Cl. 360-33.100.
Tsukada, Masaharu; Kimizuka, Junichi; and Shimizu, Haruo, 4,496,238, Cl. 355-14.00D.

Caravelle Industries, Inc.: *See*—
Roncaglione, James W.; and Roncaglione, Daniel E., 4,495,667, Cl. 15-53.00A.

Carberry, Victor V. Low pressure relief valve assembly for high pressure boiler. 4,495,899, Cl. 122-504.000.

Cardell, Max L., to Celanese Corporation. Apparatus for cutting, aspirating and rethreading a traveling filamentary yarn. 4,496,109, Cl. 242-18.00R.

Carl Freudenberg, Firma: *See*—
Hartmann, Ludwig; Ruzek, Ivo; and Locher, Engelbert, 4,496,508, Cl. 264-167.000.

Carl, Heinz. Displacement body. 4,495,744, Cl. 52-576.000.

Carl Schenck AG:: *See*—
Muller, Michael; Giers, Alfred; and Heiland, Manfred, 4,495,811, Cl. 73-462.000.

Carl-Zeiss-Stiftung: *See*—
Machler, Meinrad; Sachse, Richard; Stacklies, Horst; and Schindler, Achim, 4,496,416, Cl. 156-293.000.

Carley, Joseph L.; Potter, James S.; and Ciccotelli, Anthony A., to Duralith Corporation. Membrane panel. 4,496,812, Cl. 200-159.00B.

Carmosino, Michael N.: *See*—
Wenzel, Wolfgang D.; and Carmosino, Michael N., 4,496,678, Cl. 524-157.000.

Carpenter, Peter E. G.; and Baker, Andrew P., to Square D Company. Switch fuse unit. 4,496,916, Cl. 337-6.000.

Carr, Richard V. C., to Air Products and Chemicals, Inc. Nitric acid recovery by the adiabatic nitration of nitroaromatics with fortified spent acid. 4,496,782, Cl. 568-934.000.

Carrera, Jacinto P., to Polaroid Corporation. Electromagnetic actuator having adjustable plunger. 4,496,921, Cl. 335-258.000.

Carrier Corporation: *See*—
Clark, William E.; and Wellman, Donald C., 4,495,986, Cl. 165-2.000.

Carroll, Frank E. Insulating shutter panels for building openings. 4,495,978, Cl. 160-117.000.

Carter, James H.: *See*—
Rozner, Alexander G.; Lenko, Daniel S.; and Carter, James H., 4,495,848, Cl. 89-1.100.

Cartier, Roger J.; Cuthbert, Victor W.; and Mason, Anthony, to Whirlpool Corporation. Suds return valve for automatic washers. 4,495,960, Cl. 137-122.000.

Cartner, Jack O. Trailing wing mower with hydraulic breakaway system. 4,495,754, Cl. 56-11.900.

Carveth, Peter: *See*—
Stone, Albert; Pyde, Edwin; and Carveth, Peter, 4,496,046, Cl. 206-219.000.

Casat Technology, Inc.: *See—*
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Cascade Engineering, Inc.: *See—*
Keller, Frederick P.; and Zwiep, Theodore C., 4,496,332, Cl. 464-89.000.

Casey, Steven M. Barrier structure. 4,496,264, Cl. 404-6.000.

Caspari, Gunter J.; and Lindberg, Steven E., to Standard Oil Company (Indiana). Stabilization of phosphorodithioic acid diesters. 4,496,495, Cl. 260-989.000.

Cassell, Ernest W., Jr.; and Gilliam, Edward C., to Reynolds Metals Company. Can end tester. 4,495,797, Cl. 73-40.000.

Cattell, Alan F.; Cockayne, Brian; Wright, Peter J.; and Kirton, John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Electroluminescent panels and method of manufacture. 4,496,610, Cl. 427-66.000.

Caunned Aktiengesellschaft: *See—*
Bagnulo, Luigi, 4,496,444, Cl. 204-148.000.

Cawse, John L.: *See—*
Still, Richard H.; Cawse, John L.; and Stanford, John L., 4,496,751, Cl. 549-472.000.

Cechanski, Michael. Explosive. 4,496,405, Cl. 149-2.000.

Celanese Corporation: *See—*
Cardell, Max L., 4,496,109, Cl. 242-18.00R.
Duey, Clarence J., Jr., 4,496,488, Cl. 260-413.000.

Celmer, Walter D.; Cullen, Walter P.; Watts, Paul C.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Erythromycin D and esters thereof. 4,496,546, Cl. 514-29.000.

Celotex Corporation, The: *See—*
Snider, Scott C.; and DeLeon, Alberto, 4,496,625, Cl. 428-318.400.

Censor Patent- und Versuchs-Anstalt: *See—*
Mayer, Herbert E., 4,496,241, Cl. 356-152.000.

Centafanti, Rocco. Golf practice device. 4,496,156, Cl. 273-184.00B.

Century Mfg. Co.: *See—*
Jegers, Viktor J.; and Lasley, Duncan T., 4,496,822, Cl. 219-125.100.

Ceramatec, Inc.: *See—*
Rasmussen, James R.; and Virkar, Anil V., 4,496,639, Cl. 429-193.000.

Cerankowski, Leon D.; LaPointe, Gary S.; and Mattucci, Neil C., to Polaroid Corporation. Color transfer photographic processes and products. 4,496,651, Cl. 430-490.000.

Ceraver: *See—*
Blanquaert, Daniel, 4,495,664, Cl. 3-1.913.

Champion International Corporation: *See—*
Faller, Rudolph A., 4,495,749, Cl. 53-471.000.
Wells, Henry A., 4,496,428, Cl. 162-256.000.

Champion Spark Plug Company: *See—*
Frikker, Jozsef, 4,496,294, Cl. 417-393.000.

Chang, Eugene Y. C. One-component polyurethane adhesive compositions. 4,496,706, Cl. 528-57.000.

Chang, Irving B.; and Beckwith, Robert E., Jr., to Allied Corporation. Article coated with a sulfur stabilized oxidized polyolefin and asphalt composition. 4,496,622, Cl. 428-280.000.

Chang, Shung-Ho: *See—*
Katz, David H.; Cooper, Steven W.; Lee, Theodore T.; and Chang, Shung-Ho, 4,496,634, Cl. 435-7.000.

Chao, Hu H., to International Business Machines Corporation. High speed low power MOS buffer circuit for converting TTL logic signal levels to MOS logic signal levels. 4,496,857, Cl. 307-475.000.

Chapman, Joseph E., III, to Schlumberger Technology Corporation. Single-wire selective perforation system. 4,496,010, Cl. 175-4.550.

Charbonnier, Marc: *See—*
Marandet, Andre J. P.; and Charbonnier, Marc, 4,496,867, Cl. 310-93.000.

Charles, Robert G.: *See—*
Nadalin, Robert J.; and Charles, Robert G., 4,496,445, Cl. 204-158.00R.

Charles Stark Draper Laboratory, Inc., The: *See—*
Grossman, Arthur, 4,495,988, Cl. 165-96.000.
Smith, T. Basil, 4,497,059, Cl. 371-36.000.

Charuau, Jean, to Commissariat a l'Energie Atomique. Pressure reducing device. 4,496,837, Cl. 250-303.000.

Chauveton, Claude, to Creusot-Loire. Stirling-cycle engine. 4,495,771, Cl. 60-525.000.

Cheever, Richard N., to Tetra Pak Developpement SA. Method of cold cathode replenishment in electron beam apparatus and replenishable cold cathode assembly. 4,496,881, Cl. 315-357.000.

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Horlbeck, Gernot; and Burzin, Klaus, 4,496,713, Cl. 528-272.000.

Chemische Werke Huls AG: *See—*
Gude, Fritz; Haferkorn, Herbert; Riemer, Heinz; and Dormann, Gunter, 4,496,710, Cl. 528-114.000.
Zagefka, Hans-Dieter; Bartz, Wilfried; and Konietzny, Alfred, 4,496,613, Cl. 427-440.000.

Chen, Chin H.; Goliber, Thomas E.; Perlstein, Jerome H.; and Reynolds, George A., to Eastman Kodak Company. Phosphorous diketonate electron accepting ring compounds as sensitizers for electron donating photoconductive compositions. 4,496,730, Cl. 546-23.000.

Chen, Hsiu Kuo; and Thomas, Charles P., to Phillips Petroleum Company. Method for plugging and subsequent treatment of subterranean formations. 4,495,995, Cl. 166-273.000.

Cheney, Maynard C.: *See—*
Annino, Raymond; Cheney, Maynard C.; and Fletcher, Kenneth S., 4,496,433, Cl. 204-1.00T.

Cheng, David: *See—*
Smith, Thomas W.; Cheng, David; and Ward, Anthony T., 4,496,957, Cl. 346-135.100.

Chernyavsky, Vladimir P.: *See—*
Antonov, Jury F.; Iogansen, Vadim I.; Tkachenko, Alexei S.; Chernyavsky, Vladimir P.; and Shapiro, Aron B., 4,496,870, Cl. 310-260.000.

Cherry, Martin. Media guide. 4,496,171, Cl. 283-61.000.

Cherry, William D.: *See—*
Goldie, Harry; and Cherry, William D., 4,496,917, Cl. 333-13.000.

Chesebrough-Pond's Inc.: *See—*
Ehrott, Charles W., 4,495,798, Cl. 73-54.000.

Chesnel, Pierre: *See—*
Pottier, Alain; and Chesnel, Pierre, 4,496,008, Cl. 175-4.600.

Chessel, Bernard: *See—*
Sarrazin, Jean-Michel; and Chessel, Bernard, 4,495,740, Cl. 52-309.100.

Chevron Research Company: *See—*
Nimer, Edward L.; and Campbell, Robert W., 4,496,659, Cl. 501-140.000.
Santilli, Donald S.; and Zones, Stacey I., 4,496,786, Cl. 585-640.000.
Sigworth, Harrison W., Jr., 4,496,001, Cl. 166-387.000.

Chi, Cheng-Chung J.; Davidson, Arthur; and Tsuei, Chang-Chyi, to International Business Machines Corporation. On-chip SQUID cascade. 4,496,854, Cl. 307-306.000.

Chiba, Toshiyuki: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,496,562, Cl. 514-207.000.

Chikaraishi, Takayo: *See—*
Tuchiya, Yoshimasa; Chikaraishi, Takayo; and Kawamo, Kazunori, 4,496,186, Cl. 296-146.000.

Children's Medical Center Corporation, The: *See—*
Gallop, Paul M.; and Paz, Mercedes, 4,496,722, Cl. 544-69.000.

Choi, Dai-Shik; and McCain, David L., to Conoco Inc. Selective mining from horizontal holes. 4,496,191, Cl. 299-17.000.

Chore-Time Equipment, Inc.: *See—*
Swartzendruber, Ray E., 4,495,894, Cl. 119-51.00R.

Chow, Edmund E.: *See—*
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,497,033, Cl. 364-551.000.

Christel, Conrad, Jr., to Pall Corporation. Sensing and indicator system for detecting heating element failures. 4,496,940, Cl. 340-640.000.

Christensen, Gordon D.; and Donaher, Charles J., to Thomas & Betts Corporation. Low or zero insertion force connector for multi-pin arrays. 4,496,205, Cl. 339-74.00R.

Chu, Chaokang: *See—*
Leeke, Gordon; Chu, Chaokang; and Dailey, Nils L., 4,496,461, Cl. 210-198.200.

Chu, Chin-Chiun, to Mobil Oil Corporation. Catalysts for para-ethyltoluene dehydrogenation. 4,496,662, Cl. 502-183.000.

Chu, Kwang-Ho: *See—*
Briggs, James E., Jr.; Chu, Kwang-Ho; and Chung, Daniel C., 4,496,677, Cl. 524-108.000.

Chueh, Chun F.: *See—*
Jacobson, Stephen E.; and Chueh, Chun F., 4,496,781, Cl. 568-862.000.

Chun-Eng, Liau: *See—*
Matsui, Masanao; Chun-Eng, Liau; Kogami, Kunio; Yano, Toshihiko; and Matsuo, Noritada, 4,496,586, Cl. 514-531.000.

Chung, Daniel C.: *See—*
Briggs, James E., Jr.; Chu, Kwang-Ho; and Chung, Daniel C., 4,496,677, Cl. 524-108.000.

Chung, Paul W.: *See—*
Blaser, Eugene M.; Chung, Paul W.; and Varshney, Ramesh C., 4,496,852, Cl. 307-269.000.

Chupp, John P.: *See—*
Ku, Audrey Y.; Chupp, John P.; and Balthazor, Terry M., 4,496,765, Cl. 564-440.000.

Ciabatti, Romeo; and Padova, Giovanna, to Gruppo Lepetit S.p.A. 1-[(Acylthiocycloalkyl)carbonyl]-L-proline derivatives. 4,496,743, Cl. 548-533.000.

Ciba-Geigy AG: *See—*
Leppard, David G.; and Rody, Jean, 4,496,649, Cl. 430-372.000.

Ciba-Geigy Corporation: *See—*
Blackwell, Joseph T., III; and Gasper, Larry, III, 4,496,728, Cl. 544-319.000.
Darms, Roland; Beyeler, Harry; and Haug, Theobald, 4,496,794, Cl. 174-68.500.
Dexter, Martin; and Winter, Roland A. E., 4,496,676, Cl. 524-99.000.
Dexter, Martin; and Winter, Roland A. E., 4,496,757, Cl. 560-82.000.
Forgo , Imre; and Francois, Jacques, 4,496,694, Cl. 525-163.000.
Iqbal, Abul; and Lienhard, Paul, 4,496,727, Cl. 544-225.000.
Schafer, Paul; and Berendt, Hans-Ulrich, 4,496,472, Cl. 252-186.220.
Wheeler, Ian R., 4,496,481, Cl. 534-579.000.

Ciccotelli, Anthony A.: *See—*
Carley, Joseph L.; Potter, James S.; and Ciccotelli, Anthony A., 4,496,812, Cl. 200-159.00B.

Cincinnati Milacron Industries, Inc.: *See—*
Hillman, Joseph T.; and Miller, Michael B., 4,496,180, Cl. 294-64.00R.

Citizen Watch Company Limited: *See*—
Waki, Masahiko; Umezawa, Seiji; Takasugi, Tsuneji; Koide, Hiroshi; and Kasai, Takao, 4,496,248, Cl. 368-280.000.

CLA-VAL Co.: *See*—
Ensign, Harold W.; and Griswold, Donald G., 4,496,845, Cl. 290-43.000.

Claas Saulgau GmbH: *See*—
Rauch, Hans, 4,495,734, Cl. 51-249.000.

Clack Corporation: *See*—
Clack, Robert A., 4,496,906, Cl. 324-439.000.

Clack, Robert A., to Clack Corporation. Liquid conductivity monitor. 4,496,906, Cl. 324-439.000.

Claeys, Daniel A.: *See*—
Janssens, Wilhelmus; and Claeys, Daniel A., 4,496,645, Cl. 430-239.000.

Clarion Co., Ltd.: *See*—
Hayashi, Hideki; Endo, Sadayoshi; Ito, Yukio; and Takagi, Satoshi, 4,497,001, Cl. 360-74.200.

Clark Equipment Company: *See*—
Bauer, James J.; and Strautins, Vilnis, 4,495,834, Cl. 74-493.000.
Haddock, Louis A., Jr., 4,495,674, Cl. 16-302.000.
Sagaser, Thomas M.; Kuhn, Patrick; and Brock, Knute K., 4,495,770, Cl. 60-486.000.

Clark, William E.; and Wellman, Donald C., to Carrier Corporation. Method of operating a variable volume multizone air conditioning unit. 4,495,986, Cl. 165-2.000.

Clarke, Beresford N. Recuperator. 4,496,314, Cl. 432-29.000.

Clatworthy, Stuart C., to Restbury Limited. Switch protection device. 4,496,941, Cl. 340-644.000.

Clausius, Richard A., to Atlantic Richfield Company. Process for purifying graphite. 4,496,533, Cl. 423-448.000.

Clemens, Donald F.: *See*—
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,465, Cl. 252-79.200.
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,466, Cl. 252-79.300.

Clemens, Robert J., to Eastman Kodak Company. Process for the preparation of dehydroacetic acid. 4,496,747, Cl. 549-291.000.

Cleveland, Donald C., to Rockwell International Corporation. Low friction power takeoff shaft. 4,496,333, Cl. 464-162.000.

Cline, Harvey E., to General Electric Company. Diffraction grating wire arrays in parallel. 4,496,634, Cl. 428-611.000.

Clorox Company, The: *See*—
Peters, Susan M., 4,496,366, Cl. 44-14.000.

Clough, John; and Hollidge, Henry H., to Automated Optics, Inc. Apparatus for positioning a contact lens under a radiuscope. 4,496,242, Cl. 356-244.000.

Clough, John M., to Imperial Chemical Industries PLC. Triazolylalkanetriol derivatives. 4,496,388, Cl. 71-76.000.

Clouse, Robert C.; and Pews, R. Garth, to Dow Chemical Company, The. Process for the preparation of 1,1'-bi-2-naphthols. 4,496,773, Cl. 568-730.000.

Coal Industry (Patents) Limited: *See*—
Meadows, Alan, 4,496,203, Cl. 339-16.00C.

Cockayne, Brian: *See*—
Cattell, Alan F.; Cockayne, Brian; Wright, Peter J.; and Kirton, John, 4,496,610, Cl. 427-66.000.

Cohen, Max. Automotive vehicle power drive system. 4,495,836, Cl. 74-751.000.

Cohen, Samuel; and Wisser, Edward F., to Hazeltine Corporation. Column/sheet metal interface. 4,496,261, Cl. 403-320.000.

Colardelle, Joel S. G.; Lerouge, Claude P. H.; and Loup, Nicole J. R., to International Standard Electric Corporation. Ringing circuit for telephone subset, designed as an integrated circuit. 4,496,798, Cl. 179-84.00T.

Cole, Gerald, to Creative Cellars, Inc. Bottle support. 4,496,124, Cl. 248-146.000.

Cole, Leland G.: *See*—
Mack, Michael H.; Corley, Sterling C.; and Cole, Leland G., 4,496,443, Cl. 204-130.000.

Coley, Charles R.; and Hall, J. Roger, to Plus One Ltd. Button for receiving and securing a fabric covering therefor and fabric-covered button assembly formed therewith. 4,495,678, Cl. 24-113.00R.

Colgate-Palmolive Company: *See*—
Karami, Hamzeh; Delvaux, Myriam; and Cooper, Terence, 4,496,358, Cl. 604-379.000.

Colles, Joseph H.; and Bixby, James A., to Eastman Kodak Company. Down converting a high frame rate signal to a standard TV frame rate signal by skipping preselected video information. 4,496,995, Cl. 360-9.100.

Collins, George J.: *See*—
Rocca, Jorge J.; and Collins, George J., 4,496,449, Cl. 204-192.00E.

Collins, Kenneth D.: *See*—
Cooke, Michael W.; Arriola, Arturo; Stegman, Julius M.; and Collins, Kenneth D., 4,495,849, Cl. 89-1.140.

Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, to Calma Company. Graphics display system and method including associative addressing. 4,496,944, Cl. 340-723.000.

Colon, Ismael, to Union Carbide Corporation. Polymerization of haloalkynes by a nickel catalyst. 4,496,700, Cl. 526-111.000.

Colonel, Kenneth: *See*—
Lau, Edward H.; and Colonel, Kenneth, 4,496,254, Cl. 400-175.000.

Colromm, Inc.: *See*—
Rocca, Jorge J.; and Collins, George J., 4,496,449, Cl. 204-192.00E.

Columbia Research Laboratories, Inc.: *See*—
Stratton, Leo M.; Sipple, Kenneth J.; and Tatonetti, Mario B., 4,495,815, Cl. 73-517.00B.

Combined Fluid Products Company: *See*—
Kist, William J., 4,495,968, Cl. 137-624.200.

Comeau, Paul E.; and Torti, Anthony, to Kenney Manufacturing Company. Master carrier and perforated tape drive combination. 4,495,671, Cl. 16-87.00R.

Commissariat a l'Energie Atomique: *See*—
Bedu, Marcel; Farcy, Jean C.; and Goin, Christian, 4,496,873, Cl. 313-231.710.
Bonnin, Michelle; Musikas, Claude; and Vitorge, Pierre, 4,496,523, Cl. 423-9.000.
Charuau, Jean, 4,496,837, Cl. 250-303.000.

Compagnie des Produits Industriels de l'Ouest: *See*—
Sarrazin, Jean-Michel; and Chessel, Bernard, 4,495,740, Cl. 52-309.100.

Compagnie Francaise de Raffinage: *See*—
Bourgogne, Michel; Guth, Jean-Louis; Szabo, Georges; and Wey, Raymond, 4,496,528, Cl. 423-328.000.

Compagnie Industrielle De Mecanismes en abrege C.I.M.: *See*—
Parizet, Roger, 4,495,827, Cl. 74-89.180.

Comstock, Harold N. Locking means for battery, etc. 4,495,787, Cl. 70-258.000.

Conley, William J. Booster cable assembly. 4,496,204, Cl. 339-29.00B.

Connaught Laboratories, Inc.: *See*—
Gordon, Lance K., 4,496,538, Cl. 424-92.000.

Conneily, Harold R., Jr. Converters for orthodontic treatment. 4,496,318, Cl. 433-14.000.

Conoco Inc.: *See*—
Choi, Dai-Shik; and McCain, David L., 4,496,191, Cl. 299-17.000.
Scott, James B.; and Radd, Fred J., 4,495,997, Cl. 166-285.000.

Conrad, Earl: *See*—
Janke, Edwin R.; and Conrad, Earl, 4,495,859, Cl. 98-59.000.

Conrad, Frederick L.; Palmer, Louis R.; and Roberts, Arthur A., to International Business Machines Corporation. Liquid chromatography proportioning valve and mixer. 4,496,245, Cl. 366-143.000.

Consortium Fur Elektrochemische Industrie GMBH: *See*—
Gebauer, Helmut, 4,496,748, Cl. 549-396.000.

Continental Can Company, Inc.: *See*—
Winkless, Robert A.; and Kulesa, Edmund M., 4,496,069, Cl. 220-260.000.

Continental Group, Inc., The: *See*—
Beck, Martin H.; and Krishnakumar, Suppayan M., 4,496,064, Cl. 215-1.00C.

Cook, William R. Combination fuel heater and fuel filter device. 4,495,928, Cl. 123-557.000.

Cooke, Michael W.; Arriola, Arturo; Stegman, Julius M.; and Collins, Kenneth D., to United States of America, Navy. Remotely activated cable cutter. 4,495,849, Cl. 89-1.140.

Cooper, Steven W.: *See*—
Katz, David H.; Cooper, Steven W.; Lee, Theodore T.; and Chang, Shung-Ho, 4,496,654, Cl. 435-7.000.

Cooper, Terence: *See*—
Karami, Hamzeh; Delvaux, Myriam; and Cooper, Terence, 4,496,358, Cl. 604-379.000.

Coppersmith, Ward J.; and LaMotte, George B., III, to Scripps Clinic and Research Foundation. Microplate washer. 4,496,657, Cl. 435-287.000.

Corley, Sterling C.: *See*—
Mack, Michael H.; Corley, Sterling C.; and Cole, Leland G., 4,496,443, Cl. 204-130.000.

Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; Hankison, Ronald L.; Hao, Ming C.; Levin, Arthur L.; McClain, George A.; Wanish, Paul J.; and Zeitler, Carl, Jr., to International Business Machines Corporation. Method and apparatus for measurements of channel operation. 4,497,022, Cl. 364-200.000.

Cornell Research Foundation, Inc.: *See*—
Nulman, Jaime; and Krusius, J. Peter, 4,496,419, Cl. 156-643.000.
Steinkraus, Keith H., 4,496,599, Cl. 426-430.000.

Corrugated Industry Development Corp.: *See*—
McGuire, Richard; and Donhowe, Herbert M., 4,497,027, Cl. 364-471.000.

Corsette, Douglas F. Liquid dispensing pump. 4,496,082, Cl. 222-153.000.

Cosden Technology, Inc.: *See*—
Hahn, Granville J., 4,496,408, Cl. 156-73.500.

Cosentino, Louis C., to Renal Systems, Inc. Percutaneous implant. 4,496,349, Cl. 604-175.000.

Cosentino, Louis C., to Renal Systems, Inc. Blood access device. 4,496,350, Cl. 604-175.000.

Cowan, James J., to Polaroid Corporation. Method and apparatus for exposing photosensitive material. 4,496,216, Cl. 350-162.170.

Craig Medical Products Limited: *See*—
Steer, Peter L.; and Edwards, John V., 4,496,354, Cl. 604-322.000.

Crame, Andrew J.; and Borthwick, Alan D., to Glaxo Group Limited. Benzodioxinopyrrole derivatives and processes for their preparation. 4,496,579, Cl. 514-411.000.

Crane, Walton B., to Industrial Designs & Services. Stacking wire for produce containers. 4,496,053, Cl. 206-510.000.

Creative Cellars, Inc.: *See*—
Cole, Gerald, 4,496,124, Cl. 248-146.000.

Credence Finance Association: *See*—
Lindstrom, Wictor C. O., 4,495,726, Cl. 49-401.000.

Crescenzo, Francis C.; and LaFleur, Paul J., Jr., to Package Machinery Company. Sealing wheel for forming fin seal package. 4,495,745, Cl. 53-77.000.

Creusot-Loire: *See—*
Chauveton, Claude, 4,495,771, Cl. 60-525.000.
Voillot, Herve , 4,496,041, Cl. 198-457.000.

Crevier, Paul H.; and Lindmayer, Istvan. Surgical stapler. 4,496,090, Cl. 227-19.000.

Croat, John J., to General Motors Corporation. High coercivity rare earth-iron magnets. 4,496,395, Cl. 75-123.

Crooks, Robert C., to Barcus-Berry, Inc. Notch filter system. 4,496,859, Cl. 307-520.000.

Crosfield Electronics Limited: *See—*
Pugsley, Peter C., 4,496,968, Cl. 358-80.000.

Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. Benzo-fused thromboxane synthetase inhibitors. 4,496,572, Cl. 514-337.000.

Crown Textile Company: *See—*
Kamat, Dattatraya V., 4,495,661, Cl. 2-97.000.

CTI International Inc.: *See—*
Morgan, Paul E., 4,495,857, Cl. 98-6.000.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Watts, Paul C.; Shibakawa, Riichiro; and Tone, Junsuke, 4,496,546, Cl. 514-29.000.

Cummings, Charles M. Flexible covering support bracket. 4,496,044, Cl. 206-45.330.

Cummins Engine Company, Inc.: *See—*
Kamo, Roy, 4,495,907, Cl. 123-193.00C.

Custom Concepts, Incorporated: *See—*
Kubiatowicz, James F., 4,496,329, Cl. 446-167.000.

Cuthbert, Victor W.: *See—*
Cartier, Roger J.; Cuthbert, Victor W.; and Mason, Anthony, 4,495,960, Cl. 137-122.000.

Cutler, Orvid R.: *See—*
Ansel, Robert E.; Cutler, Orvid R.; and Moschovis, Elias P., 4,496,210, Cl. 350-96.300.

Cycles Peugeot: *See—*
Fourrey, Francois; and Mauffrey, Jean-Francois, 4,495,833, Cl. 74-493.000.

D. Agustin Amador Arcas Y Nipor S.A.: *See—*
Jodar, Francisco Y.; and Arcas, Agustin A., 4,495,892, Cl. 119-16.000.

Dahm, Joseph J.: *See—*
Spinks, Raleigh J., Jr.; Edwards, Richard C.; and Dahm, Joseph J., 4,496,953, Cl. 343-792.000.

Daidotokushuko Kabushikikaisha: *See—*
Yamada, Shunsuke; Kawate, Kenji; Ono, Takashi; Arakawa, Hideo; and Suda, Tsuyoshi, 4,496,312, Cl. 432-11.000.

Dailey, Nils L.: *See—*
Leeke, Gordon; Chu, Chaokang; and Dailey, Nils L., 4,496,461, Cl. 210-198.200.

Daimler-Benz AG: *See—*
Bender, Franz; Hertweck, Gernot; Grohn, Michael; and Moser, Peter, 4,495,906, Cl. 123-188.0GC.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Matsumoto, Jun-ichi; and Nakamura, Shinichi, 4,496,566, Cl. 514-254.000.

Dainippon Screen Manufacturing Co., Ltd.: *See—*
Mitsuka, Ikuo, 4,496,956, Cl. 346-108.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Hirosawa, Makoto, 4,496,989, Cl. 358-296.000.

Daisy Systems, Holland B.V.: *See—*
Morsing, Gijsbertus B., 4,496,253, Cl. 400-163.100.

d'Alayer de Costemore d'Arc, Stephane M., to Staar S. A. System for detecting the operative face of a disc carrying data on one face only. 4,497,049, Cl. 369-50.000.

Dana Corporation: *See—*
Gray, Larry O., 4,495,913, Cl. 123-352.000.

Danfoss A/S: *See—*
Petersen, Tom K., 4,496,894, Cl. 318-759.000.

Daniel, Maurice. Lightpipe network with optical devices for distributing electromagnetic radiation. 4,496,211, Cl. 350-96.200.

Daniel, Neville H.; and Duncan, Hugh M., to Austin Rover Group Limited. Control system for air/fuel ratio adjustment system. 4,495,919, Cl. 123-440.000.

Danner, Melvin F.: *See—*
Morstain, Barry R.; and Danner, Melvin F., 4,496,148, Cl. 273-1.00E.

Dantan, Olivier, to Brissonneau et Lotz Marine. Means of measuring stress affecting mountings for jacking mechanisms on ocean platforms. 4,495,824, Cl. 73-862.640.

D'Antonio, Nicholas F.; Knabel, Walter; and Stempfhuber, Lorenz, to Marker-Patentverwertungsgesellschaft mbH; and Kinetronic Industries, Inc. Current supply circuit for electronic safety ski bindings. 4,496,168, Cl. 280-612.000.

Darms, Roland; Beyeler, Harry; and Haug, Theobald, to Ciba-Geigy Corporation. Flexible base materials, their preparation and their use for printed circuits. 4,496,794, Cl. 174-68.500.

Dastis, Rainer: *See—*
Schorcht, Adelbrecht; Klingenfeld, Dietmar; Hesse, Reiner; Dastis, Rainer; and Linz, Volker, 4,496,970, Cl. 358-101.000.

Davidson, Arthur: *See—*
Chi, Cheng-Chung J.; Davidson, Arthur; and Tsuei, Chang-Chyi, 4,496,854, Cl. 307-306.000.

Davies, Richard A.; Lee, Michael W.; Rodenberger, Frank A.; Hill, James R.; Kulavich, David P.; and Sowell, Donald L., to Goodyear Tire & Rubber Company, The. Bead jamming or crimping method. 4,496,411, Cl. 156-136.000.

Davis, Douglas A. Limb bundler and bag holder. 4,495,862, Cl. 100-34.000.

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Deatcher, John H.; and Goswami, Jagadish C., to Stauffer Chemical Company. Laminate for the protection of motor vehicle bodies. 4,496,628, Cl. 428-337.000.

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Bergstein, Wolfgang; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,496,729, Cl. 544-336.000.

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Engelhart, John E.; Angeles, Marshall R.; and D'Errico, Michael J., 4,496,581, Cl. 514-438.000.
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Desai, Ashvin D.; and Bujack, Alvin, to Mueller Steam Specialty, A Division of Core Industries, Inc. Duplex strainer. 4,496,463, Cl. 210-341.000.
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Devic, Michel, to PCUK Produits Chimiques Ugine Kuhlmann. Process of decomposition of a complex of ortho-benzoyl benzoic acid, hydrogen fluoride and boron trifluoride. 4,496,760, Cl. 562-460.000.
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Funk, David B.; Kallmeyer, James D.; and Harker, Wesley H., 4,496,907, Cl. 324-445.000.
Dickinson, Roger P.: *See*—
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Jenkins, Arthur E. O., 4,496,430, Cl. 202-158.000.
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Djelalian, Madeleine: *See*—
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Black, Arthur G.; Dodge, John H.; and Ernst, Larry M., 4,496,829, Cl. 219-497.000.
Doherty, James B., to Merck & Co., Inc. Process for the preparation of 5-aroyl-1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-1-carboxylic acid derivative. 4,496,741, Cl. 548-453.000.
Domdey, Otto. Process for generating electric power by means of turbogenerators using high pressure vapor. 4,495,774, Cl. 60-649.000.
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Hefner, Robert E., Jr., 4,496,688, Cl. 525-44.000.
McCarthy, James R.; and Widner, Paul J., 4,496,725, Cl. 544-184.000.
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Dowling, Donald J.; Richter, Albert P., Jr.; Warren, Wayne F.; and Arnold, Dan M., to Texaco Inc. In-situ permeability determining method. 4,495,805, Cl. 73-155.000.
Draiswerke GmbH: *See*—
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Dresser Industries, Inc.: *See*—
Eckman, Richard E., 4,495,681, Cl. 29-26.00A.
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D'Silva, Themistocles D. J., to Union Carbide Corporation. Process for preparing symmetrical bis-carbamates. 4,496,721, Cl. 544-58.200.
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Ducasse, Joseph C. V. Automatic sprinkling device. 4,496,104, Cl. 239-240.000.
Duchadeau, Pierre, to Pari-Symac. Devices which comprise a helical spring used as conveying, extracting, quantity-controlling or mixing means. 4,496,086, Cl. 222-412.000.
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Duenke, Clarence G., to Warco, Inc. Transformer switch. 4,496,805, Cl. 200-11.0TC.

Duey, Clarence J., Jr., to Celanese Corporation. Copper and manganese removal from C_6–C_9 saturated aliphatic monocarboxylic acids. 4,496,488, Cl. 260-413.000.

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Dunkley, James L.; and Dobkin, Robert C., to National Semiconductor Corporation. Semiconductor device with an ion implanted stabilization layer. 4,496,963, Cl. 357-22.000.

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Kamstra, Paulus R., 4,496,344, Cl. 604-90.000.

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Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,496,750, Cl. 549-455.000.
Ensminger, Joseph M., 4,496,207, Cl. 339-99.00R.
Haugh, Eugene F.; Kitts, Earle L., Jr.; and Mickewich, Daniel J., 4,496,652, Cl. 430-569.000.
Irwin, Robert S., 4,496,712, Cl. 528-191.000.
Kilkson, Henn, 4,496,361, Cl. 604-408.000.
Levitt, George, 4,496,392, Cl. 71-93.000.
McNutt, James E.; Scott, Robert J.; and Welch, Charles W., 4,496,612, Cl. 427-310.000.
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Moberg, William K., 4,496,551, Cl. 514-63.000.
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Duralith Corporation: *See—*
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Durden, John A.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. Insecticidal bis-carbamate sulfides. 4,496,591, Cl. 514-477.000.

Durik, Jeffrey R. Rotary tablet machine. 4,495,685, Cl. 29-402.080.

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Dyar, Harrison G. Thermal insulating system particularly adapted for building construction. 4,495,742, Cl. 52-407.000.

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Dyfverman, Tomas. Method in the editing of kinematographic picture material. 4,496,991, Cl. 358-311.000.

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Geschka, Hugo W., 4,496,925, Cl. 336-178.000.

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Wong, Thomas M., 4,496,554, Cl. 514-179.000.

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Eastcott, Peter D.; and Trussler, Ronald C., to Canadian General Electric Company Limited. Electric inching impulse control. 4,496,883, Cl. 318-98.000.

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Clemens, Robert J., 4,496,747, Cl. 549-291.000.
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Kashdan, David S., 4,496,762, Cl. 564-170.000.
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Tamary, Ernest J., 4,496,235, Cl. 355-3.0FU.
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Gooch, Douglas C., 4,495,838, Cl. 74-869.000.
Morscheck, Timothy J., 4,495,837, Cl. 74-869.000.
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Northman, Bradley L., 4,496,101, Cl. 239-102.000.
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Edamura, Fred Y.: *See—*
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Edwards, Robert B., II: *See—*
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Morimoto, Takuo; Nishiuchi, Kihachiro; Izumi, Misao; and Ejima, Noriyoshi, 4,496,469, Cl. 252-62.000.

Eklund, Tore. Load holder. 4,496,089, Cl. 224-329.000.

Electro-Petroleum, Inc.: *See—*
Titus, Charles H.; Wittle, John K.; and Bell, Christy W., 4,495,990, Cl. 166-65.00R.

Electron Beam Corporation: *See—*
Longamore, Robert G., 4,495,966, Cl. 137-614.010.

Electrotechnik-Apparatebau Peter Schmitz: *See—*
Sachse, Christian, 4,497,016, Cl. 362-294.000.

Elek, Demeter: *See—*
Apetrei, Constantin; Nitigus, Victor; Elek, Demeter; Radulescu, Marian; and Sachelaire, Toma, 4,496,864, Cl. 310-77.000.

Elkins, Johnny C. Unitary rack with latch means. 4,495,735, Cl. 52-27.000.

Elliott Turbomachinery Co., Inc.: *See—*
Starta, Daniel G.; and Hood, Richard W., 4,495,842, Cl. 82-4.00R.

Ellison, Burlan E.; Spranca, Harry P.; and Hooper, Christopher C., to Atlantic Building Systems, Inc. Standing seam roof system. 4,495,743, Cl. 52-478.000.

EMAB Electrolux Motor Aktiebolag: *See—*
Andreasson, Jan Y. N., 4,495,911, Cl. 123-198.00R.

EMF Corporation: *See—*
Weyer, Robert K., 4,496,143, Cl. 271-112.000.

Emi Electrola Gesellschaft mit berschrankter Haftung: *See—*
Strausfeld, Hermann, 4,496,300, Cl. 425-408.000.

EMI Limited: *See—*
Hounsfield, Godfrey N., 4,497,061, Cl. 378-18.000.

Emig, Reiner: *See—*
Braschel, Volker; Emig, Reiner; Leiber, Heinz; Mendel, Michael; and Gerstenmeier, Jurgen, 4,497,026, Cl. 364-426.000.

Emory, John E., Jr., to Big Jon, Inc. Rod holder assembly. 4,495,721, Cl. 43-21.200.

Enamel Products and Plating Co.: *See*—
Anderson, William J.; and Anderson, Wayne R., 4,496,060, Cl. 211-124.000.

Encee Chemical Sales, Inc.: *See*—
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,465, Cl. 252-79.200.
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,466, Cl. 252-79.300.

Endo, Masaji; and Hikone, Takami, to Sumitomo Special Metals Co., Ltd. Fe-Cr-Co Type magnet body of columnar structure and method for the preparation of same. 4,496,402, Cl. 148-31.570.

Endo, Sadayoshi: *See*—
Hayashi, Hideki; Endo, Sadayoshi; Ito, Yukio; and Takagi, Satoshi, 4,497,001, Cl. 360-74.200.

Endoh, Kenjiro. *See*—
Kitagawa, Kazuo; Endoh, Kenjiro; and Kira, Hideshi, 4,496,937, Cl. 340-347.0SH.

Endoh, Takeyuki: *See*—
Yabuuchi, Shigeru; Endoh, Takeyuki; Kodama, Kazuyuki; and Ide, Jushi, 4,497,035, Cl. 364-577.000.

Engelhart, John E.; Angeles, Marshall R.; and D'Errico, Michael J., to Merck & Co., Inc. 1,2-Dibromo-2-cyano-2-(heterocyclic)alkane compounds and antimicrobial use thereof. 4,496,581, Cl. 514-438.000.

Engineering and Research Associates, Inc.: *See*—
Acker, Loren C.; Taylor, Junius E.; and Minney, Stephen C., 4,496,819, Cl. 219-10.810.

England, David C.: *See*—
Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,496,750, Cl. 549-455.000.

Enoki, Takashi: *See*—
Nakashima, Fujio; Enoki, Takashi; and Nakashima, Kazuto, 4,496,947, Cl. 340-825.240.

Enomoto, Seiji: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,496,850, Cl. 307-269.000.

Ensign, Harold W.; and Griswold, Donald G., to CLA-VAL Co. Method and apparatus for control of a turbine generator. 4,496,845, Cl. 290-43.000.

Ensminger, Joseph M., to Du Pont de Nemours, E. I., and Company. Electrical connector with dual position latches. 4,496,207, Cl. 339-99.00R.

Erickson, Donald P., to Rocky Mountain Sheet Metal Company, Inc. Fixed blade air blender apparatus. 4,495,858, Cl. 98-38.100.

Erickson, Eric D.: *See*—
Heller, Carl A.; Erickson, Eric D.; and Greni, Sterling R., 4,496,520, Cl. 422-60.000.

Eriksen, Gunnar, to Thune-Eureka A/S. Assembly for heat treatment of a papermaking wire or felt. 4,495,714, Cl. 34-111.000.

Ernst, Alfons, to Johannes Heidenhain GmbH. Apparatus for measuring the angular displacement of two objects relative to each other. 4,495,700, Cl. 33-1.00N.

Ernst, Larry M.: *See*—
Black, Arthur G.; Dodge, John H.; and Ernst, Larry M., 4,496,829, Cl. 219-497.000.

Ernst Leitz Wetzlar GmbH: *See*—
Heitmann, Knut; and Schaefer, Klaus-Dieter, 4,496,231, Cl. 354-429.000.

Ernst Stadelmann Gesellschaft m.b.H.: *See*—
Kirchner, Balthasar; and Siegfried, Schleicher, 4,496,050, Cl. 206-444.000.

Espin, Mario W. Video tape cassette and device therefor. 4,496,999, Cl. 360-60.000.

Ethyl Corporation: *See*—
Bauer, Dennis P., 4,496,756, Cl. 560-41.000.

Evans, John M.; and Ashwood, Valerie A., to Beecham Group p.l.c. Chromans and chromenes, compositions and hypertensive method. 4,496,565, Cl. 514-222.000.

Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. 1,2,3,3,5,6-Hexamethyl-bicyclo[2.2.2]-oct-5-en-2-ol, process for producing same, intermediates useful in said process and organoleptic uses of same. 4,496,775, Cl. 568-820.000.

Evg Entwicklungs- und Verwertungs-Gesellschaft m.b.H.: *See*—
Ritter, Gerhard; Ritter, Klaus; and Jahrbacher, Gerhard, 4,496,820, Cl. 219-87.000.

Exner, Gunter, to Fulgurit GmbH & Co. Kommanditgesellschaft. Process for depositing a coat of paint on wood-cement boards. 4,496,636, Cl. 428-703.000.

Extracorporeal Medical Specialties, Inc.: *See*—
Lee, Kyu H., 4,496,458, Cl. 210-90.000.

Exxon Research & Engineering Co.: *See*—
Hafez, Mahmoud M.; and Pauls, Henry W., 4,496,456, Cl. 208-33.000.
Myers, Richard S.; Michaelson, Robert C.; and Austin, Richard G., 4,496,778, Cl. 568-860.000.
Myers, Richard S.; Michaelson, Robert C.; and Austin, Richard G., 4,496,779, Cl. 568-860.000.

Ezell, James J.; and Garin, Paul V., III, to A G Motor Corp. Floating cab. 4,496,188, Cl. 296-190.000.

Ezis, Andre; Beckwith, Elaine C.; and Blair, Howard D., to Ford Motor Company. Method of making a densified silicon nitride/oxynitride composite. 4,496,503, Cl. 264-56.000.

Fabian, George J.: *See*—
Dugan, Elmo A.; Kish, Louis G.; Miller, Edwin J.; and Fabian, George J., 4,496,159, Cl. 273-341.000.

Fabinski, Walter; and Deptolla, Udo, to Hartmann & Braun AG. Non-dispersive infrared gas analyzer. 4,496,840, Cl. 250-343.000.

Fahmy, Mohamed A. H., to FMC Corporation. O-Halophenyl O-alkyl S-tert-butyl phosphorothioates as pesticides. 4,496,552, Cl. 514-147.000.

Fairchild Industries, Inc.: *See*—
Renshaw, Theodore A.; and Sarrantonio, Albert, 4,496,095, Cl. 228-102.000.

Faller, Rudolph A., to Champion International Corporation. Food tray and packaging process. 4,495,749, Cl. 53-471.000.

Fanuc Ltd.: *See*—
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,496,889, Cl. 318-565.000.
Nozawa, Ryoichiro; and Kawamura, Hideaki, 4,497,028, Cl. 364-474.000.

Farber, Heinrich: *See*—
Thate, Kurt; Farber, Heinrich; and Muller, Jurgen, 4,496,273, Cl. 414-411.000.

Farber, Hobart A. Coin counting device. 4,495,959, Cl. 133-1.00A.

Farber, Karlheinz; and Nelzow, Hartmann, to Bosch-Siemens Hausgeraete GmbH. Automatic household beverage dispenser. 4,496,080, Cl. 222-129.300.

Farcy, Jean C.: *See*—
Bedu, Marcel; Farcy, Jean C.; and Goin, Christian, 4,496,873, Cl. 313-231.710.

Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, to Rhone-Poulenc Sante. Cephalosporin derivatives, and pharmaceutical compositions containing them. 4,496,560, Cl. 514-204.000.

Farm Fresh Shrimp Corporation: *See*—
Dugan, Charles; and Dugan, Timothy, 4,495,891, Cl. 119-2.000.

Farmaceutisk Laboratorium Ferring A/S: *See*—
Halskov, Soren, 4,496,553, Cl. 514-166.000.

Farrey, Merlyn F., to Fomo Products, Inc. Dispensing apparatus. 4,496,081, Cl. 222-135.000.

Fassbender, Rolf: *See*—
Tischer, Werner; Liebert, Karl-Heinz; and Fassbender, Rolf, 4,495,769, Cl. 60-451.000.

Faust, James H.; and Borch, Michael J., to A B C Auto Alarms, Inc. Vibration sensitive trip switch for vehicle alarm system of the like. 4,496,809, Cl. 200-61.45R.

Feast, William J.: *See*—
Bott, David C.; Edwards, John H.; and Feast, William J., 4,496,702, Cl. 526-285.000.

Feklin, Valentin I.: *See*—
Mazo, Boris M.; and Feklin, Valentin I., 4,496,011, Cl. 175-19.000.

Feldman, Stephen. Disassociative/reassociative chemical heat pump. 4,495,985, Cl. 165-1.000.

Fenton, Donald M.: *See*—
Delaney, Dennis D.; and Fenton, Donald M., 4,496,534, Cl. 423-573.00R.

Ferguson, Donald C.: *See*—
Smith, Merrill M.; and Ferguson, Donald C., 4,496,414, Cl. 156-246.000.

Ferguson, Douglas M.; Owens, William M.; Lang, Michael; and Lincoln, Jay P., to W. L. Gore & Associates, Inc. Multi-panel folder for surgical sutures. 4,496,045, Cl. 206-63.300.

Fethke, Wayne G.; and Call, Daniel D., to Oy Fiskars AB. Scissors sheath having integral blade sharpener. 4,495,696, Cl. 30-138.000.

Fiat Auto S.p.A.: *See*—
Nannini, Alessandro; and Pagano, Roberto, 4,495,901, Cl. 123-2.000.

Fiat Products Incorporated: *See*—
Walsh, Thomas J.; Bachman, Robert; and Aderhold, Ronald, 4,496,125, Cl. 248-188.000.

Field, Michael E.; and Sullivan, William H., to United States of America, Energy. Precision liquid level sensor. 4,495,807, Cl. 73-290.00R.

Finan, Michael; Finan, Peter; and Divilly, Michael, to Ballintubber Enterprises Limited. Apparatus for harvesting peat. 4,495,716, Cl. 37-3.000.

Finan, Peter: *See*—
Finan, Michael; Finan, Peter; and Divilly, Michael, 4,495,716, Cl. 37-3.000.

Finic, B.V.: *See*—
Ressi di Cervia, Arturo L., 4,496,268, Cl. 405-133.000.

Finnan, Marshall N., to Occidental Research Corporation. Tube and tube sheet assembly. 4,495,987, Cl. 165-70.000.

Fischbeck, Kenneth H., to Xerox Corporation. Ink jet ejector utilizing check valves to prevent air ingestion. 4,496,960, Cl. 346-140.00R.

Fischer, Ferdinand J., III, to Shell Oil Company. Parachute profiler. 4,495,808, Cl. 73-432.00R.

Fischer, Kenneth C., to Eaton Corporation. Encoding system for optic data link. 4,497,068, Cl. 455-608.000.

Fischer, Richard J., to Gates Rubber Company, The. Radially extensible joint packing with O-ring. 4,496,161, Cl. 277-1.000.

Fisher, D. Larry, to Sunwood Energy Systems, Inc. Thermal collector and storage system. 4,495,937, Cl. 126-430.000.

Fisher, Harry; and Fisher, Stuart, to Yoshida Kogyo K. K. Apparatus for producing slide fasteners from continuous fastener chain. 4,495,686, Cl. 29-409.000.

Fisher, Harry S., to Spider Staging, Inc. Mobile outrigger for suspending scaffold. 4,496,027, Cl. 182-142.000.

Fisher, Martin J.; Heron, Roger A.; and Hughes, Martin L., to National Research Development Corporation. Determining the level of contaminants in a hydraulic system. 4,495,799, Cl. 73-61.00R.
Fisher, Stuart: *See—*
Fisher, Harry; and Fisher, Stuart; 4,495,686, Cl. 29-409.000.
Fishman, David S.: *See—*
Gottlieb, Michael M.; Fishman, David S.; and Buysse, Henri, 4,497,012, Cl. 361-306.000.
Fitzmayer, Louis H., to General Electric Company. Microwave excitation system. 4,496,814, Cl. 219-10.55F.
Fleck, George J., to Whirlpool Corporation. Insulated cabinet collar corner element. 4,496,072, Cl. 220-432.000.
Fleming, Philip F.; Martin, Virgil B.; Villers, Roger L.; and Shutes, Jaime J., to Gehl Company. Forage harvester drive and electric control therefor. 4,496,105, Cl. 241-32.000.
Fleming, William F., III: *See—*
Hester, Benny L.; and Fleming, William F., III, 4,495,796, Cl. 73-38.000.
Fletcher, Kenneth S.: *See—*
Annino, Raymond; Cheney, Maynard C.; and Fletcher, Kenneth S., 4,496,433, Cl. 204-1.00T.
Florence, Robert A.; Campbell, John R.; and Williams, Robert E., Jr., to General Electric Company. Synthesis of zwitterionic siloxane polymers. 4,496,705, Cl. 528-34.000.
Flynn, Matthew J.: *See—*
Ong, Helen H.; and Flynn, Matthew J., 4,496,582, Cl. 514-450.000.
FMC Corporation: *See—*
Fahmy, Mohamed A. H., 4,496,552, Cl. 514-147.000.
Gottwaldt, Paul R., 4,495,853, Cl. 89-46.000.
Focke & Co.: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,495,746, Cl. 53-389.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Packaging apparatus for producing and feeding blanks to a packaging station. 4,495,746, Cl. 53-389.000.
Fohlen, George M.: *See—*
Varma, Indra K.; Fohlen, George M.; and Parker, John A., 4,496,701, Cl. 526-262.000.
Fomo Products, Inc.: *See—*
Farrey, Merlyn F., 4,496,081, Cl. 222-135.000.
Ford, John M. B.; and Foster, Donald D., to Realex Corporation. Dispensing pump for containers with large closures. 4,496,085, Cl. 222-321.000.
Ford Motor Company: *See—*
Ezis, Andre; Beckwith, Elaine C.; and Blair, Howard D., 4,496,503, Cl. 264-56.000.
Forgo , Imre; and Francois, Jacques, to Ciba-Geigy Corporation. Process for producing a storage-stable, miscible curing agent for acrylate resin adhesives. 4,496,694, Cl. 525-163.000.
Forte, Don A.; and Thompson, Michael L., to Manville Service Coporation. Testing device for electrically analyzing a high pressure sodium lighting fixture and lamp. 4,496,905, Cl. 324-414.000.
Foshee, William R.: *See—*
Best, Walter E.; and Foshee, William R., 4,496,178, Cl. 292-169.130.
Foster, Donald D.: *See—*
Ford, John M. B.; and Foster, Donald D., 4,496,085, Cl. 222-321.000.
Foster, Randy C.: *See—*
Quick, Terrence R.; Miranti, Joseph P., Jr.; and Foster, Randy C., 4,496,335, Cl. 474-15.000.
Foucher, Gerard, to Alsthom-Atlantique. Connector for connecting two rotors together. 4,496,259, Cl. 403-14.000.
Fouquet, Gerd: *See—*
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Lucas, Ekhart; Merger, Franz; and Nees, Friedbert, 4,496,770, Cl. 568-463.000.
Fourie, Phillippus J. Device for cleaning teeth. 4,495,956, Cl. 132-92.00R.
Fournier, Andre; and Billet, Gilles, to Microndе. Relay for ultra high frequency coaxial switching. 4,496,919, Cl. 335-5.000.
Fourrey, Francois; and Mauffrey, Jean-Francois, to Cycles Peugeot. Steering column adjustable in height. 4,495,833, Cl. 74-493.000.
Fowler, Leslie L. Centrifugal evaporation apparatus. 4,496,431, Cl. 202-83.000.
Fowler, Tracy J.: *See—*
Haake, Joseph R.; Fowler, Tracy J.; and Jensen, James W., 4,496,417, Cl. 156-361.000.
Fox, Austin L., to Molins PLC. Transferring packets. 4,495,750, Cl. 53-575.000.
Foxboro Company, The: *See—*
Annino, Raymond; Cheney, Maynard C.; and Fletcher, Kenneth S., 4,496,433, Cl. 204-1.00T.
Fragale, Joseph V. Compact asphalt laying machine for sidewalks and the like. 4,496,265, Cl. 404-110.000.
Fraige, Richard. Buoyant fiber product. 4,496,623, Cl. 428-283.000.
Francois, Jacques: *See—*
Forgo , Imre; and Francois, Jacques, 4,496,694, Cl. 525-163.000.
Franz, John E.; and Kaufman, Robert J., to Monsanto Company. Amide derivatives of N-trifluoroacetyl-N-phosphonomethylglycine, herbicidal compositions and use. 4,496,389, Cl. 71-86.000.
Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. KG: *See—*
Jopt, Uwe; and Eder, Hans, 4,495,708, Cl. 33-438.000.
Frase, Roland J.; and Bettin, Leonard A., to International Harvester Co. Rearwardly folding agricultural implement. 4,496,004, Cl. 172-311.000.
Fredrickson, James C.; Noga, Patricia J.; and Strasek, Frank M. Foot appliance. 4,495,715, Cl. 36-113.000.
Freebersyser, Steven R.: *See—*
Loncrini, Donald F.; Haag, Thomas E.; and Freebersyser, Steven R., 4,496,576, Cl. 514-389.000.
Frehel, Daniel: *See—*
Maffrand, Jean-Pierre; and Frehel, Daniel, 4,496,568, Cl. 514-301.000.
Freitag, Gary T.; and Smith, Roger C., to Reed Rock Bit Company. Bit breaker. 4,495,840, Cl. 81-54.000.
French, Michael J. Wave-energy converter. 4,495,765, Cl. 60-398.000.
Frerichs, Klaus-Dieter, to Olympia Werke AG. Coupling for the leakage-free connection of fluid-filled pipes and containers. 4,496,959, Cl. 346-140.00R.
Friedman, Anna M.: *See—*
Lindberg, Eric T.; and Friedman, Anna M., 4,496,023, Cl. 181-230.000.
Friedrich, Heinz: *See—*
Bergstein, Wolfgang; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,496,729, Cl. 544-336.000.
Frikker, Jozsef, to Champion Spark Plug Company. Diaphragm pump. 4,496,294, Cl. 417-393.000.
Froehling, Paul H.; Anders, Jude R.; Strojny, Lawrence J.; and Rehberger, James M., to Johnson Service Company. Direct digital control apparatus for automated monitoring and control of building systems. 4,497,031, Cl. 364-505.000.
Frohlich, Sigurd; and Morris, James V., to BMC Industries, Inc. Process for plasma desmear etching of printed circuit boards and apparatus used therein. 4,496,420, Cl. 156-643.000.
Frommhold, Joachim. Flexible solar heat collector. 4,495,936, Cl. 126-426.000.
Fuchs, Adrian: *See—*
Salour, Michael M.; and Fuchs, Adrian, 4,495,782, Cl. 62-514.00R.
Fuentes, Ricardo, Jr.: *See—*
Gessell, Donald E.; Gibbs, Ronald L.; and Fuentes, Ricardo, Jr., 4,496,660, Cl. 502-111.000.
Fuji Photo Film Co., Ltd.: *See—*
Horikawa, Kazuo; and Arakawa, Satoshi, 4,496,973, Cl. 358-111.000.
Kasuga, Akira; Hibino, Noburo; and Miyatsuka, Hajime, 4,496,626, Cl. 428-336.000.
Oishi, Kengo; and Suzuki, Osamu, 4,496,118, Cl. 242-198.000.
Oishi, Kengo; and Suzuki, Osamu, 4,497,009, Cl. 360-133.000.
Takenaka, Yuji, 4,496,983, Cl. 358-287.000.
Umemoto, Chiyuki; and Kohketsu, Kazuo, 4,496,838, Cl. 250-327.200.
Yagihara, Morio; Hirano, Tsumoru; and Umemoto, Makoto, 4,496,650, Cl. 430-381.000.
Fuji Xerox Co., Ltd.: *See—*
Iwasaki, Yasuo, 4,496,142, Cl. 271-3.000.
Kato, Takaaki; Kato, Takeshi; and Yoshizawa, Yoshikazu, 4,497,037, Cl. 364-900.000.
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,496,988, Cl. 358-294.000.
Shinohara, Tatsuoki, 4,497,032, Cl. 364-513.500.
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Nunomura, Shigeki; Sakurai, Yojiro; and Okutome, Toshiyuki, to Torii & Co. Ltd. Amidine derivatives with anti-complement activity. 4,496,584, Cl. 514-510.000.
Fujiie, Kazuhiko; and Nonaka, Chiaki, to Sony Corporation. Optical disc player with focus control during search mode. 4,497,047, Cl. 369-45.000.
Fujimori Kogyo Co., Ltd.: *See—*
Azuma, Tadashi; Akamatsu, Yoshihiro; Akiyama, Hiroyuki; and Yoshimura, Shohei, 4,496,627, Cl. 428-336.000.
Fujimori, Toshiyuki: *See—*
Kubo, Hirofumi; and Fujimori, Toshiyuki, 4,496,926, Cl. 336-205.000.
Fujimura, Akira; and Ozaki, Shunzaburo, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio control system for an internal combustion engine. 4,495,922, Cl. 123-440.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,496,562, Cl. 514-207.000.
Fujita, Nobuhiko: *See—*
Hitotsuyanagi, Hajime; Fujita, Nobuhiko; Itozaki, Hideo; and Kawai, Hiromu, 4,496,450, Cl. 204-192.00R.
Fujita, Shozo: *See—*
Futatsuishi, Shunichi; Fujita, Shozo; and Takushima, Takashi, 4,495,719, Cl. 40-590.000.
Fujitsu Limited: *See—*
Kitakami, Hazime; Ishikawa, Hiroshi; Tezuka, Masayoshi; Adachi, Susumu; and Makinouchi, Akifumi, 4,497,039, Cl. 364-900.000.
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,496,850, Cl. 307-269.000.
Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, 4,496,951, Cl. 343-394.000.
Zenitani, Hideki; Oka, Akira; Okamoto, Itsuo; Hayashi, Hisao; and Taniguchi, Masajiro, 4,496,057, Cl. 211-26.000.
Fukasawa, Takeshi: *See—*
Masaki, Mikio; Nara, Etuo; Shimizu, Keiichi; and Fukasawa, Takeshi, 4,495,786, Cl. 70-186.000.
Fukuda, Joji; and Yamashiki, Yutaka, to Sony Corporation. Microcomputer system operating in multiple modes. 4,497,021, Cl. 364-200.000.

Fukuda, Junzo: *See*—
Kita, Katsuhiko; Fukuda, Junzo; and Kawahito, Shiro, 4,496,509, Cl. 264-175.000.

Fukuda, Tsuguo: *See*—
Terashima, Kazutaka; and Fukuda, Tsuguo, 4,496,424, Cl. 156-601.000.

Fukui, Kazuyuki, to Minolta Camera Kabushiki Kaisha. Sheet feeding apparatus. 4,496,145, Cl. 271-122.000.

Fukumura, Kagenori: *See*—
Yasue, Hideki; and Fukumura, Kagenori, 4,495,830, Cl. 74-467.000.

Fukushima, Toshitsugi, to Sun Dengyosha Company, Limited. Illumination type push button switch. 4,496,813, Cl. 200-314.000.

Fukuyama, Hiroomi; and Isobe, Shinichi, to Fanuc Ltd. Method of diagnosing a servomotor control circuit. 4,496,889, Cl. 318-565.000.

Fulgurit GmbH & Co. Kommanditgesellschaft: *See*—
Exner, Gunter, 4,496,636, Cl. 428-703.000.

Funahashi, Soukichi, to Konishiroku Photo Industry Co., Ltd. Abnormality detecting device. 4,497,010, Cl. 361-93.000.

Funk, David B.; Kallmeyer, James D.; and Harker, Wesley H., to Dickey-John Corporation. Method and apparatus for non-destructively determining ingredients of a sample. 4,496,907, Cl. 324-445.000.

Furubayashi, Hisatoshi: *See*—
Watanabe, Masanori; Furubayashi, Hisatoshi; Tanaka, Junichi; and Hijikigawa, Masaya, 4,496,931, Cl. 338-34.000.

Furukawa, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Encoding and decoding systems for binary data. 4,496,934, Cl. 340-347.0DD.

Furusho, Takao: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,561, Cl. 514-209.000.
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,574, Cl. 514-195.000.

Furuta, Yohichi; Tsubouchi, Kaoru; and Nanamura, Kaoru, to Aisin Seiki Kabushiki Kaisha. Brake master cylinder. 4,495,772, Cl. 60-533.000.

Futatsuishi, Shunichi; Fujita, Shozo; and Takushima, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Movable display apparatus. 4,495,719, Cl. 40-590.000.

G. D. Searle & Co.: *See*—
Garland, Robert B., 4,496,485, Cl. 260-351.100.

Gaarde, Knud-Werner: *See*—
Overland, Christian; and Gaarde, Knud-Werner, 4,496,353, Cl. 604-272.000.

Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., to Xerox Corporation. Electrostatic reproducing machine. 4,496,233, Cl. 355-3.0TR.

Gagnon, James J., to J-W Operating Company. Control system for engine-driven compressor unit and method of operation thereof. 4,496,286, Cl. 417-22.000.

Galbiati, Ambrogio, to W. R. Grace & Co., Cryovac Div. Apparatus and method for packaging articles in a flexible wrapping material. 4,495,751, Cl. 53-576.000.

Gallop, Paul M.; and Paz, Mercedes, to Children's Medical Center Corporation, The. Reporter compounds. 4,496,722, Cl. 544-69.000.

GAO Gesellschaft Fur Automation Und Organisation mbH.: *See*—
Devrient, Ludwig, 4,496,961, Cl. 346-206.000.

Garavuso, Gerald M.: *See*—
Perun, William D.; and Garavuso, Gerald M., 4,496,144, Cl. 271-114.000.

Garin, Paul V., III: *See*—
Ezell, James J.; and Garin, Paul V., III, 4,496,188, Cl. 296-190.000.

Garland, Robert B., to G. D. Searle & Co. Asymmetric 7-O-(substituted acetyl)-4-demethoxydaunomycinones. 4,496,485, Cl. 260-351.100.

Gasparri, Alfred, Jr., to Texas Instruments Incorporated. Video data acquisition system. 4,497,066, Cl. 382-48.000.

Gasper, Larry, III: *See*—
Blackwell, Joseph T., III; and Gasper, Larry, III, 4,496,728, Cl. 544-319.000.

Gates Rubber Company, The: *See*—
Fischer, Richard J., 4,496,161, Cl. 277-1.000.

Gatley, Derrick R., to Wilkinson Sword Limited. Pack for razors. 4,496,047, Cl. 206-354.000.

Gatling, Grafton G. Underground cooling system and method. 4,495,781, Cl. 62-260.000.

Gattman, John W. Foot support for ladder. 4,496,025, Cl. 182-121.000.

Gattu, Narahari; and Terranova, Joseph C., III, to Harnischfeger Corporation. Crane having stabilizing outriggers. 4,496,062, Cl. 212-189.000.

GCA Corporation: *See*—
Walton, Frank J., 4,496,423, Cl. 156-345.000.

Gebauer, Helmut, to Consortium Fur Elektrochemische Industrie GMBH. Substituted macrobicyclic ethers, the manufacture and use thereof. 4,496,748, Cl. 549-396.000.

Gebr. Bode & Co. GmbH: *See*—
Britzke, Ingo; and Dilcher, Dietmar, 4,495,729, Cl. 49-212.000.

Gee, Mark G.: *See*—
Almond, Eric A.; and Gee, Mark G., 4,496,372, Cl. 51-309.000.

Gehl Company: *See*—
Fleming, Philip F.; Martin, Virgil B.; Villers, Roger L.; and Shutes, Jaime J., 4,496,105, Cl. 241-32.000.

Geist, Jacob M.; Vines, Harvey L.; Alvarez, Miguel R.; Rowles, Howard C.; and Woodward, Donald W., to Air Products and Chemicals, Inc. Process using serpentine heat exchange relationship for condensing substantially single component gas streams. 4,496,382, Cl. 62-31.000.

Geka, Toshiaki, to Nippon Thompson Co., Ltd. Roller bearing for endless linear motion. 4,496,198, Cl. 308-6.00C.

Gelbein, Abraham P.; and Kwon, Joon T., to Lummus Company, The. Production of epoxy compounds from olefinic compounds. 4,496,752, Cl. 549-521.000.

Gelinas, Rejean. Anti-theft window bar. 4,495,727, Cl. 49-56.000.

Genelin, Gregory U. Method for eliciting responses by animals to moving, visually discernible stimuli, and apparatus for providing a moving visually discernible stimulus. 4,495,893, Cl. 119-29.000.

General Dynamics, Pomona Division: *See*—
Dedow, Karen A., 4,496,406, Cl. 156-66.000.

General Electric Company: *See*—
Ackerman, John F., 4,496,844, Cl. 250-483.100.
Ashby, Bruce A., 4,496,680, Cl. 524-265.000.
Cline, Harvey E., 4,496,634, Cl. 428-611.000.
Fitzmayer, Louis H., 4,496,814, Cl. 219-10.55F.
Florence, Robert A.; Campbell, John R.; and Williams, Robert E., Jr., 4,496,705, Cl. 528-34.000.
Hanson, John R.; Hauser, James L.; Kilfeather, James F., Jr.; and Hendriks, Hendrik B., 4,496,793, Cl. 174-68.500.
Jensen, Gerald A.; Wesbey, William H.; and Riederer, Stephen J., 4,496,985, Cl. 358-111.000.
Lahut, Joseph A.; and Popelish, John A., 4,496,962, Cl. 346-74.500.
Lippitt, David L.; and Walker, Loren H., 4,496,899, Cl. 323-207.000.
Pritzkow, Dennis H.; and Vavrek, Robert M., 4,496,841, Cl. 250-374.000.
Rosenquist, Niles R.; and Tyrell, John A., 4,496,693, Cl. 525-146.000.
Roth, David A., 4,497,024, Cl. 364-414.000.
Schoenig, Frederick C., Jr.; Grossman, Leonard N.; Lai, Ching C.; Masaitis, William; and Canada, Robert O., 4,496,056, Cl. 209-539.000.
Smith, Peter H., 4,496,817, Cl. 219-10.55M.
Terhune, James H., 4,495,821, Cl. 73-753.000.
Tessarzik, Juergen M.; Myers, Albert; and Yuille, James D., 4,495,810, Cl. 73-432.00R.
True, Thomas T.; and Good, William E., 4,496,969, Cl. 358-62.000.
Wynn, Stephen R., 4,496,912, Cl. 331-1.00A.

General Foods Corporation: *See*—
Parliment, Thomas H., 4,496,600, Cl. 426-535.000.
Rispoli, Joseph M.; Rogers, Morris A.; Sergenian, Haig H.; Swartley, John S.; and Topalian, Harry, 4,496,601, Cl. 426-554.000.
Stoeckli, Oscar W.; and Berry, David J., 4,496,596, Cl. 426-388.000.

General Instrument Corporation: *See*—
Streiber, Ronald W., 4,496,853, Cl. 307-270.000.

General Kinematics Corporation: *See*—
Musschoot, Albert, 4,495,826, Cl. 74-87.000.

General Motors Corporation: *See*—
Croat, John J., 4,496,395, Cl. 75-123 E.
Kotowski, Thomas W., 4,496,849, Cl. 307-254.000.
Reynolds, Michael G.; and Brittin, Craig E., 4,496,818, Cl. 219-10.570.

General Signal Corporation: *See*—
Alexander, Warren R., 4,496,808, Cl. 200-61.45R.
Ludwig, Albert R., 4,496,244, Cl. 366-136.000.
Walsh, Thomas J., 4,496,250, Cl. 374-186.000.

Genese, Joseph N.; and Seberg, Charles H., to Abbott Laboratories. Venipuncture device. 4,496,348, Cl. 604-167.000.

George Fischer Limited: *See*—
Lustenberger, Hans, 4,496,393, Cl. 75-58.000.

Gerard A. Wurdack & Associates, Inc.: *See*—
Wurdack, Gerard A.; and Morgan, Gene L., 4,496,890, Cl. 318-600.000.

Gerber, Joseph R., Jr., to Gerber Legendary Blades. Concave grind knife blade and method of making. 4,495,698, Cl. 30-357.000.

Gerber Legendary Blades: *See*—
Gerber, Joseph R., Jr., 4,495,698, Cl. 30-357.000.

Gericke AG: *See*—
Gericke, Hermann; and Schavilje, Robert, 4,496,083, Cl. 222-231.000.

Gericke, Hermann; and Schavilje, Robert, to Gericke AG. Loose or bulk good container equipped with a device for the discharge of loose or bulk goods. 4,496,083, Cl. 222-231.000.

Gerstenmeier, Jurgen: *See*—
Braschel, Volker; Emig, Reiner; Leiber, Heinz; Mendel, Michael; and Gerstenmeier, Jurgen, 4,497,026, Cl. 364-426.000.

Geschka, Hugo W., to E. Blum GmbH & Co. Stepped iron core for static or dynamic electric machines. 4,496,925, Cl. 336-178.000.

Gessell, Donald E.; Gibbs, Ronald L.; and Fuentes, Ricardo, Jr., to Dow Chemical Company, The. Catalyst prepared from organo-magnesium compound; oxygen- or nitrogen-containing compound; halide source; transition metal compound and reducing agent. 4,496,660, Cl. 502-111.000.

Gg. Noell GmbH: *See*—
Krieger, Friedrich, 4,496,182, Cl. 294-81.00R.

Gibbs, Ronald L.: *See*—
Gessell, Donald E.; Gibbs, Ronald L.; and Fuentes, Ricardo, Jr., 4,496,660, Cl. 502-111.000.

Gibson, Christian D.: *See*—
Allen, Ralph E.; and Gibson, Christian D., 4,496,031, Cl. 187-9.00R.

Giede, Karl: *See*—
Moller, Hinrich; Wallat, Siegfried; Hoffkes, Horst; and Giede, Karl, 4,496,536, Cl. 424-70.000.

Giers, Alfred: *See*—
Muller, Michael; Giers, Alfred; and Heiland, Manfred, 4,495,811, Cl. 73-452.000.

Gillberg, Lars I.: *See—*
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,496,367, Cl. 44-51.000.

Gillette Company, The: *See—*
Gruner, George P., 4,496,308, Cl. 431-101.000.

Gilliam, Edward C.: *See—*
Cassell, Ernest W., Jr.; and Gilliam, Edward C., 4,495,797, Cl. 73-40.000.

Gilligan, Thomas J., to Ampex Corporation. Selective mapping system and method. 4,497,020, Cl. 364-200.000.

Gilliland, Claire. Three player backgammon gameboard. 4,496,157, Cl. 273-248.000.

Gilman, David J.: *See—*
Yellin, Tobias O.; and Gilman, David J., 4,496,564, Cl. 514-237.000.
Yellin, Tobias O.; Gilman, David J.; Edwards, Philip N.; Large, Michael S.; Jones, Derrick F.; and Oldham, Keith, 4,496,571, Cl. 514-340.000.

Gilmore, Cecilia: *See—*
Miller, Donald E.; Gilmore, Cecilia; Dimler, Steven R.; and Werstak, Charles E., 4,496,602, Cl. 426-555.000.

Ginardi, Jack L., to Valley Candle Mfg. Co., Inc. Candle including flame adjustment means and automatic flame extinguisher means. 4,496,307, Cl. 431-34.000.

Ginnings, Paul R., to Goodyear Tire & Rubber Company, The. High slip polyester films containing siloxane units. 4,496,704, Cl. 528-26.000.

Ginter, Sally P.: *See—*
Pawloski, Chester E.; and Ginter, Sally P., 4,496,494, Cl. 260-977.000.

Gist, Adolphus V.: *See—*
Doorakian, George A.; Paul, Marsha A.; and Gist, Adolphus V., 4,496,709, Cl. 528-89.000.

Gist-Brocades N.V.: *See—*
Bruynes, Cornelis A.; and Jurriens, Theodorus K., 4,496,720, Cl. 544-29.000.

Givaudan Corporation: *See—*
Naegeli, Peter; and Rohr, Martin, 4,496,476, Cl. 252-522.00R.

Givler, John D., to Stanadyne, Inc. Mixing valve with water modulation sealing means. 4,495,969, Cl. 137-625.170.

Glass, Frank S.: *See—*
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,497,033, Cl. 364-551.000.

Glass, Joseph: *See—*
Panick, Karl; and Glass, Joseph, 4,496,292, Cl. 417-252.000.

Glaxo Group Limited: *See—*
Crame, Andrew J.; and Borthwick, Alan D., 4,496,579, Cl. 514-411.000.

Gleasman, Vernon E., to Gleason Works, The. Differential gearing assembly. 4,495,835, Cl. 74-715.000.

Gleason Works, The: *See—*
Gleasman, Vernon E., 4,495,835, Cl. 74-715.000.

Global Manufacturing Co. Inc.: *See—*
Tompkins, L. Kirk, 4,496,076, Cl. 222-3.000.

Gloviak, John A., to Stewart-Warner Corporation. Automatic lubrication assembly. 4,496,030, Cl. 184-45.00R.

Gnaedinger, John P., to John P. Gnaedinger Research Corporation. Lime or lime:fly ash pretreated pavement construction material and method. 4,496,267, Cl. 404-82.000.

Gnagy, Clayton C., to United States of America, Air Force. Integrated insulation wall assembly. 4,495,764, Cl. 60-255.000.

GNB Batteries Inc.: *See—*
Waber, Glenn R., 4,497,019, Cl. 364-132.000.

Goin, Christian: *See—*
Bedu, Marcel; Farcy, Jean C.; and Goin, Christian, 4,496,873, Cl. 313-231.710.

Gokhman, Alexander, to Allis-Chalmers Corporation. Reversible two-stage hydraulic machine. 4,496,282, Cl. 415-161.000.

Goldfarb, Israel. Hand-manipulatable three-dimensional puzzle. 4,496,155, Cl. 273-153.00S.

Goldie, Harry; and Cherry, William D., to United States of America, Air Force. RF-Primed high power halogen vial apparatus. 4,496,917, Cl. 333-13.000.

Goldman, Ralph F.: *See—*
Madnick, Herman; and Goldman, Ralph F., 4,495,659, Cl. 2-66.000.

Goliber, Thomas E.: *See—*
Chen, Chin H.; Goliber, Thomas E.; Perlstein, Jerome H.; and Reynolds, George A., 4,496,730, Cl. 546-23.000.

Gomes, John M.; and Piotroski, Peter N., to Pitney Bowes Inc. Method and apparatus for customizing a multi-station document-inserter. 4,497,040, Cl. 364-900.000.

Gooch, Douglas C., to Eaton Corporation. Reverse preselect control. 4,495,838, Cl. 74-869.000.

Good, William E.: *See—*
True, Thomas T.; and Good, William E., 4,496,969, Cl. 358-62.000.

Goodyear Aerospace Corporation: *See—*
Hall, John M.; and Pantic, Milan, 4,496,033, Cl. 188-347.000.
Liggett, Paul E., 4,496,707, Cl. 528-61.000.

Goodyear Tire & Rubber Company, The: *See—*
Brandyberry, Dennis R.; and Rye, Grover W., 4,495,759, Cl. 57-58.520.
Davies, Richard A.; Lee, Michael W.; Rodenberger, Frank A.; Hill, James R.; Kulavich, David P.; and Sowell, Donald L., 4,496,411, Cl. 156-136.000.
Ginnings, Paul R., 4,496,704, Cl. 528-26.000.
Heater, Paul L., Jr.; Bletso, Nelson C.; and Tung, William C. T., 4,496,673, Cl. 523-458.000.
Johnson, David W., 4,495,755, Cl. 56-364.000.

Gordon, Gary B.; Joy, Robert; and Lee, Michael J., to Hewlett-Packard Company. Three state driver for inductive loads. 4,496,886, Cl. 318-254.000.

Gordon, Lance K., to Connaught Laboratories, Inc. *Haemophilus influenzae* b polysaccharide-diphtheria toxoid conjugate vaccine. 4,496,538, Cl. 424-92.000.

Gorris, Joannes J. H. M., to U.S. Philips Corporation. Method and device for balancing circular plate-shaped objects. 4,495,812, Cl. 73-468.000.

Goscianski, Michel, to U.S. Philips Corporation. Information display device comprising a liquid crystal cell. 4,496,220, Cl. 350-341.000.

Goswami, Jagadish C.: *See—*
Deatcher, John H.; and Goswami, Jagadish C., 4,496,628, Cl. 428-337.000.

Goto, Akio: *See—*
Muto, Toshiaki; and Goto, Akio, 4,495,790, Cl. 72-326.000.

Goto, Kunio: *See—*
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Gotoh, Takayuki: *See—*
Nanba, Yasuhiro; Gotoh, Takayuki; Yamakawa, Eiji; and Karasaki, Toshihiko, 4,496,834, Cl. 250-211.00R.

Gotou, Takeo: *See—*
Morishita, Akira; Tanaka, Toshinori; Matsumoto, Kouichi; and Gotou, Takeo, 4,495,905, Cl. 123-179.00F.

Gottlieb, Michael M.; Fishman, David S.; and Buysse, Henri, to Rogers Corporation. Decoupling capacitor and method of manufacture thereof. 4,497,012, Cl. 361-306.000.

Gottwaldt, Paul R., to FMC Corporation. Fixed elevation automatic loading system for fixed ammunition. 4,495,853, Cl. 89-46.000.

Gould, Francis E.; and Johnston, Christian W., to Tyndale Plains-Hunter, Ltd. Polyurethane polyene compositions. 4,496,535, Cl. 424-19.000.

Gould Inc.: *See—*
Tekippe, Vincent J., 4,495,819, Cl. 73-705.000.

Graham, Anne M.: *See—*
Pesa, Frederick A.; and Graham, Anne M., 4,496,666, Cl. 518-706.000.

Grant, Thomas S.; and Myers, Charles L., to Borg-Warner Chemicals, Inc. Alloys of styrenic resins and polyamides. 4,496,690, Cl. 525-66.000.

Grathnail Development Company Limited: *See—*
Le Blanc Smith, Guy; and Howard, Derik, 4,495,804, Cl. 73-152.000.

Grauel, Ingolf; Hofer, Gerald; Kulke, Gunter; and Stumpe, Werner, to Robert Bosch GmbH. Pressure medium brake system. 4,496,192, Cl. 303-13.000.

Gray, Larry O., to Dana Corporation. Ignition current sensor for an electronic speed control system. 4,495,913, Cl. 123-352.000.

Grecksch, Hans: *See—*
Raasch, Hans; Grecksch, Hans; and Bock, Klaus, 4,496,110, Cl. 242-35.50A.

Green, Robert J.; and Hinchcliffe, Dennis, to Molins PLC. Apparatus for forming groups of cigarettes. 4,496,055, Cl. 209-536.000.

Greenblatt, Richard W., to Portable Terminal Corp. Portable information display. 4,496,943, Cl. 340-711.000.

Greif, Norbert; Oppenlaender, Knut; Hettche, Albert; and Vamvakaris, Christos, to BASF Aktiengesellschaft. Acidic zinc-plating bath. 4,496,439, Cl. 204-55.00R.

Greiner, James G.; and Priepke, Edward H., to Sperry Corporation. Pickup attachment for harvesting machines. 4,495,756, Cl. 56-364.000.

Greiner, Joachim; and Nippe, Burkhard, to Agfa-Gevaert Aktiengesellschaft. Magneto-optical storage process. 4,497,007, Cl. 360-114.000.

Greni, Sterling R.: *See—*
Heller, Carl A.; Erickson, Eric D.; and Greni, Sterling R., 4,496,520, Cl. 422-60.000.

Greskovich, Eugene J.; and Zanchuk, Walter A., to Air Products and Chemicals, Inc. Combustion of high ash coals. 4,495,874, Cl. 110-347.000.

Grimmer, John E. Compound turbocharger system for an internal combustion engine. 4,496,291, Cl. 417-247.000.

Griswold, Donald G.: *See—*
Ensign, Harold W.; and Griswold, Donald G., 4,496,845, Cl. 290-43.000.

Groetzinger, John K.: *See—*
Heithoff, Robert B.; Groetzinger, John K.; and Schwenninger, Ronald L., 4,496,387, Cl. 65-335.000.

Grogler, Gerhard: *See—*
Kopp, Richard; Grogler, Gerhard; Reiff, Helmut; and Dieterich, Dieter, 4,496,491, Cl. 260-453.0AR.

Grohn, Michael: *See—*
Bender, Franz; Herlweck, Gernot; Grohn, Michael; and Moser, Peter, 4,495,906, Cl. 123-188.0GC.

Gross, Horst, to Draiswerke GmbH. Agitator-grinder. 4,496,106, Cl. 241-46.170.

Grossman, Arthur, to Charles Stark Draper Laboratory, Inc., The. Controlled heat exchanger system. 4,495,988, Cl. 165-96.000.

Grossman, Leonard N.: *See—*
Schoenig, Frederick C., Jr.; Grossman, Leonard N.; Lai, Ching C.; Masaitis, William; and Canada, Robert O., 4,496,056, Cl. 209-539.000.

Gruner, George P., to Gillette Company, The. Shock mounting for incandescent mantle. 4,496,308, Cl. 431-101.000.

Gruppo Lepetit S.p.A.: *See*—
Ciabatti, Romeo; and Padova, Giovanna, 4,496,743, Cl. 548-533.000.
Gte Automatic Electric Inc.: *See*—
Young, John S., 4,496,800, Cl. 179-175.20R.
GTE Products Corporation: *See*—
Armstrong, Donald E., 4,496,311, Cl. 431-359.000.
Gude, Fritz; Haferkorn, Herbert; Riemer, Heinz; and Dormann, Gunter, to Chemische Werke Huls AG. Process for the production of flat varnishes. 4,496,710, Cl. 528-114.000.
Gulbenkian, Aylin H.: *See*—
Campbell, Kent D.; Gulbenkian, Aylin H.; Edamura, Fred Y.; and Kyriacou, Demetrios, 4,496,440, Cl. 204-78.000.
Gunther, Bernd-Rainer, to A. Nattermann & Cie. GmbH. Method for the preparation of phosphatidyl choline of low oil content. 4,496,486, Cl. 260-403.000.
Gupta, Krishna M., to Porous Materials, Inc. Permeameter. 4,495,795, Cl. 73-38.000.
Guth, Jean-Louis: *See*—
Bourgogne, Michel; Guth, Jean-Louis; Szabo, Georges; and Wey, Raymond, 4,496,528, Cl. 423-328.000.
Gutknecht, LeRoy N.: *See*—
Wichinsky, Michael; and Gutknecht, LeRoy N., 4,496,160, Cl. 273-369.000.
Guyette, Richard R.: *See*—
Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; Hankison, Ronald L.; Hao, Ming C.; Levin, Arthur L.; McClain, George A.; Wanish, Paul J.; and Zeitler, Carl, Jr., 4,497,022, Cl. 364-200.000.
Guzik, Rudolph, to Bell & Howell. Apparatus for and methods of making bimodal electrophotographic copies. 4,496,232, Cl. 355-3.0CH.
Guzman, Angel: *See*—
Muchowski, Joseph M.; and Guzman, Angel, 4,496,577, Cl. 514-392.000.
Haag, Thomas E.: *See*—
Loncrini, Donald F.; Haag, Thomas E.; and Freebersyser, Steven R., 4,496,576, Cl. 514-389.000.
Haake, Joseph R.; Fowler, Tracy J.; and Jensen, James W., to Adolph Coors Company. Control stretch laminating device. 4,496,417, Cl. 156-361.000.
Haarstad, Richard O.; and Kammerer, Jerry L., to Hydraulic Specialty Company. Secondary flow fluid filter. 4,496,460, Cl. 210-132.000.
Habelt, Gerhard; and Mucha, Franz, to U.S. Philips Corporation. Transport roller for a record carrier in a printer. 4,496,257, Cl. 400-578.000.
Haber, Alexander. Method for vehicle body shaping. 4,496,500, Cl. 264-36.000.
Habuto, Akinaka: *See*—
Kuwahara, Rikiya; Habuto, Akinaka; and Oiso, Hisayoshi, 4,496,592, Cl. 426-5.000.
Hachitani, Shuji: *See*—
Ishii, Yoshiya; Hachitani, Shuji; and Tanaka, Yasushi, 4,495,914, Cl. 123-357.000.
Haddock, Louis A., Jr., to Clark Equipment Company. Concealed door hinge having a double pivotal mounting. 4,495,674, Cl. 16-302.000.
Haferkorn, Herbert: *See*—
Gude, Fritz; Haferkorn, Herbert; Riemer, Heinz; and Dormann, Gunter, 4,496,710, Cl. 528-114.000.
Hafez, Mahmoud M.; and Pauls, Henry W., to Exxon Research & Engineering Co. Method for preparing thin regenerated cellulose membranes of high flux and selectivity for organic liquids separations. 4,496,456, Cl. 208-33.000.
Hager, Harold E., to Washington Research Foundation. Sensing device for detecting the presence of a gas contained in a mixture thereof. 4,495,793, Cl. 73-23.000.
Hagiwara, Michiaki: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; and Hagiwara, Michiaki, 4,495,691, Cl. 29-527.500.
Hagstrom, Arthur A.; and Swanson, Carl D., to Teletype Corporation. Desk top keyboard display terminal with an articulated keyboard. 4,496,200, Cl. 312-208.000.
Hahn, Granville J., to Cosden Technology, Inc. Method for producing biaxially oriented hollow articles. 4,496,408, Cl. 156-73.500.
Halcon SD Group, Inc., The: *See*—
Jacobson, Stephen E.; and Chueh, Chun F., 4,496,781, Cl. 568-862.000.
Halder, Mathis, to Lgz Landis & Gyr Zug Ag. Current divider for current measurement in conjunction with a measurement transducer. 4,496,932, Cl. 338-49.000.
Hall, J. Roger: *See*—
Coley, Charles R.; and Hall, J. Roger, 4,495,678, Cl. 24-113.00R.
Hall, John M.; and Pantic, Milan, to Goodyear Aerospace Corporation. Dual piston actuator. 4,496,033, Cl. 188-347.000.
Hall, Kenneth F.; and Beecher, William H., to Illinois Tool Works Inc. External female urinary appliance. 4,496,355, Cl. 604-327.000.
Halperin, Arnold: *See*—
Di Stefano, Thomas H.; and Halperin, Arnold, 4,496,900, Cl. 324-51.000.
Halskov, Soren, to Farmaceutisk Laboratorium Ferring A/S. Pharmaceutical composition and method for the treatment of colitis ulcerosa and Crohn's disease by oral administration. 4,496,553, Cl. 514-166.000.
Ham, William E., to RCA Corporation. Process for forming an improved silicon-on-sapphire device. 4,496,418, Cl. 156-643.000.
Hamakawa, Yoshihiro; Okamoto, Hiroaki; and Okuda, Kouji, to Osaka Transformer Co., Ltd. Photovoltaic device. 4,496,788, Cl. 136-249.000.
Hamamoto, Takashi: *See*—
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Hambrecht, Juergen; Reffert, Rudi W.; Echte, Adolf; and Swoboda, Johann, to BASF Aktiengesellschaft. Stabilization of polyphenylene ether solutions. 4,496,679, Cl. 524-111.000.
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Heithoff, Robert B.; Groetzinger, John K.; and Schwenninger, Ronald L., to PPG Industries, Inc. Transition between batch preheating and liquefying stages apparatus. 4,496,387, Cl. 65-335.000.
Heitmann, Jurgen, to Robert Bosch GmbH. Conversion of the scanning line count of television pictures. 4,496,974, Cl. 358-140.000.
Heitmann, Knut; and Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Mirror reflex camera with exposure meter. 4,496,231, Cl. 354-429.000.
Heller, Carl A.; Erickson, Eric D.; and Greni, Sterling R., to United States of America, Navy. Field detection of 2,4,6-trinitrotoluene in water by ion-exchange resins. 4,496,520, Cl. 422-60.000.
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Hensley, Clifford J. Filter apparatus and method. 4,496,464, Cl. 210-792.000.
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Herman, Harry H., Jr., to International Healthcare Products, Inc. Bathtub cushion lift assembly. 4,495,666, Cl. 4-564.000.
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Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., to Process Technologies, Inc. Multiplexed arrangement for connecting a plurality of transducers to a field interface device at a storage tank. 4,497,033, Cl. 364-551.000.
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Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., to Ashland Oil, Inc. Process for cracking high-boiling hydrocarbons using continuous addition of acidity enhancing additives. 4,496,665, Cl. 502-521.000.

Hetz, G. Brian. Polymeric belt cutting apparatus and method of making same. 4,496,269, Cl. 409-132.000.

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Hille, Hans-Dieter; and Harten, Rolf, to BASF Farben & Fasern AG. Aqueous dispersions based on a polyurethane synthetic resin. 4,496,675, Cl. 524-77.000.

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Hiraiwa, Kazuyoshi; and Kawaguchi, Akio, to Nissan Motor Company, Limited. Gear operating mechanism of an automotive manual transmission. 4,495,832, Cl. 74-475.000.

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Martin, Lawrence L.; and Setescak, Linda L., 4,496,580, Cl. 514-443.000.
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Scherschlicht, Richard R.; and Tissot, Rene , 4,496,545, Cl. 514-16.000.

Hoke, Leander H., Jr.: *See—*
Lubchenko, Eugene; Hoke, Leander H., Jr.; and Burton, Richard J., 4,496,986, Cl. 358-114.000.

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Ohishi, Kishiro; and Kato, Choji, 4,496,111, Cl. 242-55.000.

Holben, Wilbur D.: *See—*
Wolf, Jerry M.; and Holben, Wilbur D., 4,496,024, Cl. 181-292.000.

Holland, Mason: *See—*
Hitch, Robert J.; and Holland, Mason, 4,495,860, Cl. 99-340.000.

Hollidge, Henry H.: *See—*
Clough, John; and Hollidge, Henry H., 4,496,242, Cl. 356-244.000.

Hollister Incorporated: *See—*
Osburn, Frank G., 4,496,357, Cl. 604-336.000.

Hollweck, Walter, to Thermostat- und Schaltgeratebau GmbH & Co. KG. Temperature responsive switch. 4,496,928, Cl. 337-94.000.

Holstein, Herbert: *See—*
Borner, Roland; Holstein, Herbert; and Sennewald, Jurgen, 4,495,733, Cl. 51-165.00R.

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Asano, Akira, 4,495,903, Cl. 123-90.380.
Fujimura, Akira; and Ozaki, Shunzaburo, 4,495,922, Cl. 123-440.000.
Hasegawa, Shumpei, 4,495,925, Cl. 123-480.000.
Inoue, Kazuo; and Kato, Kentaro, 4,495,773, Cl. 60-605.000.
Mitsuishi, Toshiro, 4,496,020, Cl. 180-219.000.
Sakaino, Michio; Igarashi, Hisashi; and Taniguchi, Yutaka, 4,495,904, Cl. 123-179.00G.
Sasaki, Kiichi; Kawade, Tateo; and Nemoto, Seiichiro, 4,496,170, Cl. 280-801.000.
Yamato, Akihiro, 4,495,927, Cl. 123-491.000.
Honda, Kiyokazu: *See*—
Kuno, Nobuyoshi; and Honda, Kiyokazu, 4,496,872, Cl. 313-113.000.
Honda, Shigemichi: *See*—
Maeyama, Sadao; Dochi, Kiyotaka; and Honda, Shigemichi, 4,496,955, Cl. 346-76.0PH.
Honeywell Inc.: *See*—
Read, Edgar L., 4,497,054, Cl. 370-58.000.
Hood, Richard W.: *See*—
Starta, Daniel G.; and Hood, Richard W., 4,495,842, Cl. 82-4.00R.
Hooper, Christopher C.: *See*—
Ellison, Burlan E.; Spranca, Harry P.; and Hooper, Christopher C., 4,495,743, Cl. 52-478.000.
Hooper, Roger. Dual-grip handle brush for painting and the like. 4,495,669, Cl. 15-143.00R.
Hoover, Lonnie D.: *See*—
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Hoppe, Dieter; and Kleemann, Heinz-Werner, to Bayer Aktiengesellschaft. Process for the preparation of 7-amino-1-dethia-1-oxa-3-hydroxymethyl-cephem-4-carboxylic acids. 4,496,723, Cl. 544-90.000.
Hopper, Steven P.: *See*—
Kanner, Bernard; Hopper, Steven P.; and Sepelak, Dennis J., 4,496,754, Cl. 556-420.000.
Hori, Yoshikazu: *See*—
Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, 4,496,951, Cl. 343-394.000.
Horie, Fujio: *See*—
Asai, Yoshimi; Takiguchi, Michitaka; and Horie, Fujio, 4,495,878, Cl. 112-158.00B.
Horikawa, Kazuo; and Arakawa, Satoshi, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus. 4,496,973, Cl. 358-111.000.
Horlbeck, Gernot; and Burzin, Klaus, to Chemische Werke Huels. Molding compositions with high toughness and hot-water resistance. 4,496,713, Cl. 528-272.000.
Horler, Hansulrich; and Koller, Rudolf, to BBC Brown, Boveri & Company, Limited. Resilient support arrangement for shaft bearings of highspeed rotors, in particular rotors of turbo machines. 4,496,252, Cl. 384-215.000.
Hortlik, Frantisek: *See*—
Junek, Jan; Vorbornik, Vaclay; Ripka, Josef; Jaros, Frantisek; Lihtarova , Ludmila; Hortlik, Frantisek; Kotrba, Zdenek; Rehackova, Bozena; and Dvorak, Ladislav, 4,495,762, Cl. 57-411.000.
Horwitz, Jerome P.: *See*—
Brooks, Samuel C.; and Horwitz, Jerome P., 4,496,555, Cl. 514-182.000.
Hosaka, Akio: *See*—
Takase, Sadao; and Hosaka, Akio, 4,495,923, Cl. 123-478.000.
Hosaka, Miyako: *See*—
Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, 4,496,611, Cl. 427-160.000.
Hoshino, Takashi; and Arai, Takao, to Hitachi, Ltd. Data error concealing method and apparatus. 4,497,055, Cl. 371-31.000.
Hosoe, Kazuya: *See*—
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,496,832, Cl. 250-201.000.
Hosomizu, Hiroshi: *See*—
Nakai, Masaaki; Sahara, Masayoshi; Hosomizu, Hiroshi; and Ishida, Tokuji, 4,496,230, Cl. 354-416.000.
Hosoya, Toshiro, to Tobishi Industries Ltd. Small shaded-pole motor. 4,496,869, Cl. 310-172.000.
Hounsfield, Godfrey N., to EMI Limited. Method and apparatus for radiography comprising calibrating means. 4,497,061, Cl. 378-18.000.
House, Roy F.; and Hoover, Lonnie D., to NL Industries, Inc. Hydrated hydroxyethyl cellulose compositions. 4,496,468, Cl. 252-8.50A.
Howard, Albert R.: *See*—
Roberts, Thomas P.; Howard, Albert R.; and Hutchison, James B., 4,496,801, Cl. 179-175.30R.
Howard, Derik: *See*—
Le Blanc Smith, Guy; and Howard, Derik, 4,495,804, Cl. 73-152.000.
Howard, Frank H.: *See*—
Riew, Changkiu K.; and Howard, Frank H., 4,496,692, Cl. 525-112.000.
Hoy, Kenneth L.: *See*—
Dehm, David C.; Hoy, Kenneth L.; and Hoy, Richard C., 4,496,708, Cl. 528-76.000.
Hoy, Paul E. Adjustable diving platform. 4,495,883, Cl. 114-343.000.
Hoy, Richard C.: *See*—
Dehm, David C.; Hoy, Kenneth L.; and Hoy, Richard C., 4,496,708, Cl. 528-76.000.
Hradek, Richard W., to Litton Systems, Inc. Variable area molecular sieve container having a thermal control system. 4,496,376, Cl. 55-163.000.
Hsin-Min, Lo. Steering column-operated accelerating and braking device for automobiles. 4,496,018, Cl. 180-78.000.
Hu, Mae W.; and Singh, Prithipal, to Syntex (U.S.A.) Company. Chloramphenicol derivatives, antigens and antibodies. 4,496,479, Cl. 260-112.00R.
Huang, Fu-chih; Jones, Howard; Lin, Clara; and Loev, Bernard, to USV Pharmaceutical Corporation. Compounds for treating hypertension. 4,496,541, Cl. 514-2.000.
Huang, Herbert P. H. Collapsible plastic tree. 4,496,615, Cl. 428-9.000.
Huang, Wann-Sheng: *See*—
Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,495,994, Cl. 166-261.000.
Hubbard, Colin; Limb, David I.; and Duckett, Melvyn, to Petrocarbon Developments Limited. Production of nitrogen from air. 4,496,383, Cl. 62-31.000.
Hubert, Jean-Marie; Bauer, Jean-Michel; and Mollet, Serge, to Le Carbone-Lorraine. Reinforced impregnated graphite structures and process for making same. 4,496,621, Cl. 428-236.000.
Hubsch, Gunter: *See*—
Brede Uwe; Hubsch, Gunter; and Stahlmann, Rudolf, 4,495,866, Cl. 102-202.000.
Hughes Aircraft Company: *See*—
Landis, Abraham L., 4,496,711, Cl. 528-125.000.
Hughes, Martin L.: *See*—
Fisher, Martin J.; Heron, Roger A.; and Hughes, Martin L., 4,495,799, Cl. 73-61.00R.
Hukazu, Tetuo: *See*—
Shimada, Masayoshi; Iizuka, Yasuhiro; and Hukazu, Tetuo, 4,496,637, Cl. 429-44.000.
Hulsey, Charles M. Adjustable orthodontic appliance. 4,496,317, Cl. 433-10.000.
Humbrecht, Remy; and Schmieder, Heinrich, to Viscosuisse S.A. Draw-textured, base-dyeable polyester yarn. 4,496,716, Cl. 528-295.000.
Hung, Peter, to Porta Systems Corp. Wire contact retention means for rotary switches. 4,496,804, Cl. 200-11.00A.
Hunt, John W.; and Patterson, Michael S., to Ontario Cancer Institute, The. Ultrasonic imaging device. 4,495,817, Cl. 73-624.000.
Hunter, Don L., to United States Borax & Chemical Corporation. N-Hexamethyleneimino thiolcarbamate compounds. 4,496,483, Cl. 260-239.0BF.
Hurner, Erwin E. Oil cleaning and recycling system. 4,495,909, Cl. 123-196.00R.
Hurtig, Karl. Switching apparatus for changing the absolute value and the permanent magnetization direction of ferromagnetic bodies, e.g. of permanent magnets. 4,497,011, Cl. 361-147.000.
Huskvarna Transportkonstruktioner AB: *See*—
Takada, Susumu; and Sagara, Hisao, 4,495,794, Cl. 73-37.500.
Husky Injection Molding Systems Inc.: *See*—
Brown, Paul, 4,496,302, Cl. 425-547.000.
Hutchins, John S.; and DeFours, Mervyn A., to Tetra Systems, Inc. Hydraulic logging technique for inverted oil wells. 4,495,992, Cl. 166-250.000.
Hutchison, James B.: *See*—
Roberts, Thomas P.; Howard, Albert R.; and Hutchison, James B., 4,496,801, Cl. 179-175.30R.
Hwang, Chong S.; and Lampert, Barry, to Rab Tec Products Corp. Connection of tray to dental articulator. 4,496,320, Cl. 433-60.000.
Hydraulic Specialty Company: *See*—
Haarstad, Richard O.; and Kammerer, Jerry L., 4,496,460, Cl. 210-132.000.
Hydril Company: *See*—
Roche, Joseph R.; Morrill, Charles D.; and Hynes, Joseph H., 4,496,173, Cl. 285-24.000.
Hymore, Frank J.; and Kreinbrink, Paul H., to Libbey-Owens-Ford Company. Method of and apparatus for bending glass sheets. 4,496,386, Cl. 65-106.000.
Hynes, Joseph H.: *See*—
Roche, Joseph R.; Morrill, Charles D.; and Hynes, Joseph H., 4,496,173, Cl. 285-24.000.
Ichihara, Noboru; and Takehara, Isamu, to Japan Servo Co., Ltd. Direct-current brushless motor. 4,496,887, Cl. 318-254.000.
Ichikawa, Tetsuo: *See*—
Kaneko, Tomonori; Mori, Shunji; Ichikawa, Tetsuo; Hiroki, Yoichi; and Kariya, Takashi, 4,495,780, Cl. 62-229.000.
ICI Americas Inc.: *See*—
Akhavein, Ali A.; and Braithwaite, Gavin B., 4,495,898, Cl. 119-156.000.
Yellin, Tobias O.; and Gilman, David J., 4,496,564, Cl. 514-237.000.
Yellin, Tobias O.; Gilman, David J.; Edwards, Philip N.; Large, Michael S.; Jones, Derrick F.; and Oldham, Keith, 4,496,571, Cl. 514-340.000.
Ide, Jushi: *See*—
Yabuuchi, Shigeru; Endoh, Takeyuki; Kodama, Kazuyuki; and Ide, Jushi, 4,497,035, Cl. 364-577.000.
Ide, Russell D. Pad-type hydrodynamic bearing. 4,496,251, Cl. 384-117.000.
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary solenoid actuator. 4,496,134, Cl. 251-65.000.
Ife, Robert J.: *See*—
Brown, Thomas H.; and Ife, Robert J., 4,496,567, Cl. 514-272.000.

Igarashi, Hisashi: *See—*
Sakaino, Michio; Igarashi, Hisashi; and Taniguchi, Yutaka, 4,495,904, Cl. 123-179.00G.

Igawa, Junichi: *See—*
Miura, Shigetaka; Igawa, Junichi; and Takata, Satoru, 4,496,902, Cl. 324-150.000.

Igi, Keishiro: *See—*
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, 4,496,714, Cl. 528-272.000.

Iizuka, Tetsuya; and Hara, Hisashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,497,043, Cl. 365-182.000.

Iizuka, Yasuhiro: *See—*
Shimada, Masayoshi; Iizuka, Yasuhiro; and Hukazu, Tetuo, 4,496,637, Cl. 429-44.000.

Ikeda Bussan Company Limited: *See—*
Tanizaki, Hiroyuki; Ebihara, Sakae; Hatanaka, Akimitsu; Ogawa, Takayoshi; and Kanazawa, Yuzo, 4,496,189, Cl. 297-63.000.

Ikeda, Kyoichi; Harada, Kinji; and Isozaki, Katsumi, to Yokogawa Hokushin Electric Corporation. Cylindrical vibrator type pressure transducer. 4,495,818, Cl. 73-702.000.

Ikeda, Masayuki, to Kabushiki Kaisha Suwa Seikosha. Synchronizing circuit for matrix television set. 4,496,977, Cl. 358-148.000.

Ikeda, Takaharu: *See—*
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, 4,496,739, Cl. 548-321.000.

Ikeda, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Washer-dehydrator having a driving gear supported in a sealing case. 4,495,784, Cl. 68-23.600.

Ikoma, Junichi: *See—*
Abe, Masayuki; Ikoma, Junichi; and Abiko, Kenzi, 4,497,003, Cl. 360-97.000.

Illinois Tool Works Inc.: *See—*
Hall, Kenneth F.; and Beecher, William H., 4,496,355, Cl. 604-327.000.

Imai, Atsuo: *See—*
Sugiuchi, Masami; and Imai, Atsuo, 4,496,638, Cl. 429-192.000.

Imasco-CDC Research Foundation: *See—*
Motycka, Jiri, 4,495,947, Cl. 128-205.140.

Imperial Chemical Industries PLC: *See—*
Clough, John M., 4,496,388, Cl. 71-76.000.
Hanson, Charles B.; and Harrison, Colin R., 4,496,663, Cl. 502-209.000.
Yellin, Tobias O.; and Gilman, David J., 4,496,564, Cl. 514-237.000.
Yellin, Tobias O.; Gilman, David J.; Edwards, Philip N.; Large, Michael S.; Jones, Derrick F.; and Oldham, Keith, 4,496,571, Cl. 514-340.000.

Inaba, Takao: *See—*
Tanaka, Isao; and Inaba, Takao, 4,496,258, Cl. 401-206.000.

Inaba, Tsutomu: *See—*
Nakamura, Toshiyuki; Inaba, Tsutomu; and Kimura, Tadashi, 4,496,293, Cl. 417-371.000.

Inaguma, Yoshiharu: *See—*
Nakamura, Keiichi; Inaguma, Yoshiharu; and Mori, Yutaka, 4,496,288, Cl. 417-213.000.

Indra, Rudolf: *See—*
Linke, Walter; Kirnbauer, Peter; and Indra, Rudolf, 4,496,501, Cl. 264-37.000.

Industra Products, Inc.: *See—*
Walker, Robert G., 4,495,692, Cl. 29-564.100.

Industrial Designs & Services: *See—*
Crane, Walton B., 4,496,053, Cl. 206-510.000.

Industrias Romi S/A: *See—*
Romi, Romeu, 4,495,843, Cl. 82-23.000.

Industrie Zanussi S.p.A.: *See—*
Bianchi, Guiseppe, 4,496,452, Cl. 204-266.000.

Infusaid Corporation: *See—*
Prosl, Frank R.; and Sampson, Edward J., 4,496,343, Cl. 604-36.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Boella, Marcello; and Rivera, Paolo, 4,496,835, Cl. 250-231.0SE.

Ingersoll-Rand Company: *See—*
Bennitt, Robert A., 4,495,964, Cl. 137-512.100.

Ingman, Harlan V.: *See—*
Kirkland, Edmund R.; Palanuik, Elko; and Ingman, Harlan V., 4,495,724, Cl. 47-57.600.

Inoue, Akihisa: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; and Hagiwara, Michiaki, 4,495,691, Cl. 29-527.500.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,496,436, Cl. 204-23.000.

Inoue, Kazuo; and Kato, Kentaro, to Honda Giken Kogyo Kabushiki Kaisha. Turbocharger for motorcycles. 4,495,773, Cl. 60-605.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Pulse electrode-positing method. 4,496,436, Cl. 204-23.000.

Inoue, Masami: *See—*
Seko, Yasutoshi; Yanagishima, Takayuki; and Inoue, Masami, 4,496,938, Cl. 340-576.000.

Inoue, Michihiro; Matsuzawa, Akira; and Takemoto, Toyoki, to Matsushita Electric Industrial Co., Ltd. Analog-digital converter with linear characteristic restoration circuit. 4,496,935, Cl. 340-347.0AD.

Inoue, Norikatsu, to Sony Corporation. Multilayer coil. 4,496,927, Cl. 336-208.000.

Intel Corporation: *See—*
Bazes, Mel, 4,496,861, Cl. 307-602.000.

Interbrev S.A.: *See—*
Scarpini, Manuela, 4,495,679, Cl. 24-414.000.

International Business Machines Corporation: *See—*
Black, Arthur G.; Dodge, John H.; and Ernst, Larry M., 4,496,829, Cl. 219-497.000.
Blaser, Eugene M.; Chung, Paul W.; and Varshney, Ramesh C., 4,496,852, Cl. 307-269.000.
Chao, Hu H., 4,496,857, Cl. 307-475.000.
Chi, Cheng-Chung J.; Davidson, Arthur; and Tsuei, Chang-Chyi, 4,496,854, Cl. 307-306.000.
Conrad, Frederick L.; Palmer, Louis R.; and Roberts, Arthur A., 4,496,245, Cl. 366-143.000.
Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; Hankison, Ronald L.; Hao, Ming C.; Levin, Arthur L.; McClain, George A.; Wanish, Paul J.; and Zeitler, Carl, Jr., 4,497,022, Cl. 364-200.000.
Di Stefano, Thomas H.; and Halperin, Arnold, 4,496,900, Cl. 324-51.000.
Irwin, John W., 4,496,954, Cl. 346-1.100.

International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,496,775, Cl. 568-820.000.
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., 4,496,467, Cl. 252-92.000.

International Harvester Co.: *See—*
Frase, Roland J.; and Bettin, Leonard A., 4,496,004, Cl. 172-311.000.

International Healthcare Products, Inc.: *See—*
Herman, Harry H., Jr., 4,495,666, Cl. 4-564.000.

International Standard Electric Corporation: *See—*
Colardelle, Joel S. G.; Lerouge, Claude P. H.; and Loup, Nicole J. R., 4,496,798, Cl. 179-84.00T.

International Telephone and Telegraph Corporation: *See—*
Borsuk, Leslie M., 4,496,213, Cl. 350-96.220.
Kingen, Rickey W.; and Duncan, Robert H., 4,496,799, Cl. 179-100.00L.

Interox Chemicals Limited: *See—*
Campbell, Ian M.; Baulch, Donald L.; and Audley, Gary J., 4,496,783, Cl. 568-947.000.
Sanderson, William R., 4,496,473, Cl. 252-186.410.

Interstate Electronics Corp.: *See—*
Suste, Joseph T., 4,496,879, Cl. 315-169.400.

Inventors Compendium International Corp.: *See—*
Valavaara, Viljo K., 4,495,768, Cl. 60-414.000.

Investment Rarities, Incorporated: *See—*
Burandt, Corliss O., 4,495,902, Cl. 123-90.160.

Iogansen, Vadim I.: *See—*
Antonov, Jury F.; Iogansen, Vadim I.; Tkachenko, Alexei S.; Chernyavsky, Vladimir P.; and Shapiro, Aron B., 4,496,870, Cl. 310-260.000.

Ipanema Company: *See—*
Kemper, Yves J., 4,495,829, Cl. 74-191.000.

Ipco Corporation: *See—*
Hillel, Arie; and Borovsky, Simcha, 4,496,351, Cl. 604-250.000.

IPS Interproject Service AB: *See—*
Torneman, Bjorn, 4,496,369, Cl. 48-92.000.

Iqbal, Abul; and Lienhard, Paul, to Ciba-Geigy Corporation. Process for the manufacture of metal complexes of isoindoline azines. 4,496,727, Cl. 544-225.000.

Irie, Toshio; and Sato, Susumu, to Kawasaki Steel Corporation. Thin steel sheet having improved baking hardenability and adapted for drawing and a method of producing the same. 4,496,400, Cl. 148-12.00C.

Irwin, John W., to International Business Machines Corporation. Reservo interval determination in an ink jet system. 4,496,954, Cl. 346-1.100.

Irwin, Lawrence F. Foot switch safety enclosure. 4,496,811, Cl. 200-86.500.

Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Optically anisotropic melt forming copolyesters. 4,496,712, Cl. 528-191.000.

Isayama, Katsuhiko: *See—*
Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, 4,496,611, Cl. 427-160.000.

Ise, Yoji, to Myotoku Ltd. Flow regulating valve. 4,495,965, Cl. 137-599.000.

Ishida, Kohji; Noguchi, Tadashi; and Numata, Tatsuo, to Pioneer Electronic Corporation. FM stereo demodulator. 4,497,063, Cl. 381-7.000.

Ishida, Naobumi: *See—*
Micetich, Ronald G.; Yamabe, Shigeru; Hirata, Shoji; and Ishida, Naobumi, 4,496,484, Cl. 260-245.20R.

Ishida, Tokuji: *See—*
Nakai, Masaaki; Sahara, Masayoshi; Hosomizu, Hiroshi; and Ishida, Tokuji, 4,496,230, Cl. 354-416.000.

Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,495,783, Cl. 68-5.00D.

Ishihara, Hideaki: *See—*
Kurita, Kazuo; and Ishihara, Hideaki, 4,496,630, Cl. 428-364.000.

Ishii, Sugao; Itou, Susumu; Kawamura, Mikio; and Tsukamoto, Tadashi, to Kawasaki Steel Corporation. Method of handling slabs by an overhead traveling crane provided with a slab grip lifter. 4,496,063, Cl. 212-270.000.

Ishii, Tsuneji; Ito, Hiroaki; and Ishikawa, Takamichi, to Asahi Glass Company, Ltd. Ion exchange membrane manufacture for electrolytic cell. 4,496,451, Cl. 204-252.000.
Ishii, Yoshiya; Hachitani, Shuji; and Tanaka, Yasushi, to Nippondenso Co., Ltd. Electric governor. 4,495,914, Cl. 123-357.000.
Ishikawa, Hiroshi: *See*—
Kitakami, Hazime; Ishikawa, Hiroshi; Tezuka, Masayoshi; Adachi, Susumu; and Makinouchi, Akifumi, 4,497,039, Cl. 364-900.000.
Ishikawa, Seizi: *See*—
Kato, Takaaki; Hirano, Yoshio; Ochiai, Takeshi; Ishikawa, Seizi; and Sakai, Kazunori, 4,497,057, Cl. 371-29.000.
Ishikawa, Takamichi: *See*—
Ishii, Tsuneji; Ito, Hiroaki; and Ishikawa, Takamichi, 4,496,451, Cl. 204-252.000.
Ishikawa, Tatsuo; and Hatakeyama, Yoshiharu, to Yoshida Industry Co., Ltd. Tubular container molding method and apparatus. 4,496,513, Cl. 264-267.000.
Ishizaki, Zentaro: *See*—
Murakami, Muneo; and Ishizaki, Zentaro, 4,495,855, Cl. 92-71.000.
Ishizuka, Ken. System for initiating the operation of an electronically-operated device. 4,496,948, Cl. 340-825.310.
Ishizumi, Kikuo: *See*—
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, 4,496,739, Cl. 548-321.000.
Iso, Tadashi: *See*—
Iwao, Jun-ichi; Oya, Masayuki; and Iso, Tadashi, 4,496,578, Cl. 514-423.000.
Isobe, Shinichi: *See*—
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,496,889, Cl. 318-565.000.
Isohata, Junji; and Sato, Mitsuya, to Canon Kabushiki Kaisha. Projection exposure apparatus. 4,496,239, Cl. 355-30.000.
Isozaki, Katsumi: *See*—
Ikeda, Kyoichi; Harada, Kinji; and Isozaki, Katsumi, 4,495,818, Cl. 73-702.000.
Itaka, Koshi; and Hara, Takushi, to Sumitomo Electric Industries, Ltd. Insulating spacer and metal sheath for gas insulated electrical equipment. 4,496,789, Cl. 174-22.00C.
Itakura, Takeshi: *See*—
Kinoshita, Harumi; Kushida, Hideo; Itakura, Takeshi; Akutsu, Masao; Takada, Takuzo; and Sugiura, Hiroaki, 4,496,517, Cl. 264-521.000.
Ito, Fumio: *See*—
Harigaya, Isao; Tamura, Shuichi; Matsuda, Mutsuhide; Hirohata, Michio; Ito, Fumio; and Taguchi, Tetsuya, 4,496,227, Cl. 354-289.120.
Ito, Hiroaki: *See*—
Ishii, Tsuneji; Ito, Hiroaki; and Ishikawa, Takamichi, 4,496,451, Cl. 204-252.000.
Ito, Kengo, to Sony Corporation. Photosensitive imaging material. 4,496,646, Cl. 430-271.000.
Ito, Yukio: *See*—
Hayashi, Hideki; Endo, Sadayoshi; Ito, Yukio; and Takagi, Satoshi, 4,497,001, Cl. 360-74.200.
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Tanaka, Tatsuo; Itoh, Hiroshi; and Sugiyama, Akihiko, 4,495,779, Cl. 62-211.000.
Itoh, Toyotsugu; and Muramatsu, Toshio, to Konishiroku Photo Industry Co., Ltd. Optical beam scanning apparatus including a cylindrical lens having its opposite ends closer to the scanned plane than its medial portion. 4,496,209, Cl. 350-6.800.
Itou, Susumu: *See*—
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Byding, Otto; and Stroberg, Rolf, 4,496,181, Cl. 294-78.00R.
Turley, Stephen E. H., 4,496,403, Cl. 148-171.000.
Ivanov, Peter. Frame-straightening device. 4,495,789, Cl. 72-302.000.
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Iwao, Jun-ichi; Oya, Masayuki; and Iso, Tadashi, to Santen Pharmaceutical Co., Ltd. Antihypertensive sulfur-containing compounds. 4,496,578, Cl. 514-423.000.
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Iwata, Akira: *See*—
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Morimoto, Takuo; Nishiuchi, Kihachiro; Izumi, Misao; and Ejima, Noriyoshi, 4,496,469, Cl. 252-62.000.
J. M. Voith GmbH: *See*—
Wohrle, Albert; and Krautzberger, Franz, 4,495,888, Cl. 118-410.000.
J-W Operating Company: *See*—
Gagnon, James J., 4,496,286, Cl. 417-22.000.
Jackemeyer, James E. Compressible portable exercising apparatus with container. 4,496,146, Cl. 272-74.000.
Jacks, Shirley L.; and Ng, Sun W. Cooking utensil. 4,495,861, Cl. 99-422.000.
Jackson, Brian L.; and Parker, Philip. Rotary microtome drive. 4,495,844, Cl. 83-715.000.
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Byars, Larry W.; and Jackson, Eric C., 4,496,421, Cl. 156-304.100.
Jacobson, Stephen E.; and Chueh, Chun F., to Halcon SD Group, Inc., The. Process for the production of ethylene glycol through the hydroformylation of glycol aldehyde. 4,496,781, Cl. 568-862.000.
Jadwin, Thomas A.: *See*—
Wilson, John C.; DeMejo, Lawrence P.; Jadwin, Thomas A.; and Merrill, Stewart H., 4,496,643, Cl. 430-110.000.
Jahrbacher, Gerhard: *See*—
Ritter, Gerhard; Ritter, Klaus; and Jahrbacher, Gerhard, 4,496,820, Cl. 219-87.000.
James Dole Corporation: *See*—
Pohorski, Daniel W., 4,495,974, Cl. 141-132.000.
Jamieson, John A.: *See*—
Bernstein, Lawrence S.; Bien, Fritz; and Jamieson, John A., 4,496,839, Cl. 250-341.000.
Janke, Edwin R.; and Conrad, Earl, to Mercury Metal Products, Inc. Cover assembly for vertical exhaust pipes. 4,495,859, Cl. 98-59.000.
Janssens, Wilhelmus; and Claeys, Daniel A., to Agfa-Gevaert, N.V. Process for the production of a photographic color image by image-wise dye diffusion transfer. 4,496,645, Cl. 430-239.000.
Japan Servo Co., Ltd.: *See*—
Ichihara, Noboru; and Takehara, Isamu, 4,496,887, Cl. 318-254.000.
Japan Styrene Paper Corporation: *See*—
Azuma, Tadashi; Akamatsu, Yoshihiro; Akiyama, Hiroyuki; and Yoshimura, Shohei, 4,496,627, Cl. 428-336.000.
Jaros, Frantisek: *See*—
Junek, Jan; Vorbornik, Vaclay; Ripka, Josef; Jaros, Frantisek; Lihtarova , Ludmila; Hortlik, Frantisek; Kotrba, Zdenek; Rehackova, Bozena; and Dvorak, Ladislav, 4,495,762, Cl. 57-411.000.
Jarvinen, Raimo M.: *See*—
Matikainen, Keijo E.; and Jarvinen, Raimo M., 4,496,796, Cl. 174-101.500.
Jean Walterscheid GmbH: *See*—
Mikeska, Felix, 4,496,334, Cl. 464-175.000.
Jegers, Viktor J.; and Lasley, Duncan T., to Century Mfg. Co. Tilting releasing latch structure for welding machine welding head. 4,496,822, Cl. 219-125.100.
Jenkins, Arthur E. O., to Distillation Technology Limited. Mass transfer apparatus. 4,496,430, Cl. 202-158.000.
Jenoptik Jena G.m.b.H.: *See*—
Schorcht, Adelbrecht; Klingenfeld, Dietmar; Hesse, Reiner; Dastis, Rainer; and Linz, Volker, 4,496,970, Cl. 358-101.000.
Jensen, Gerald A.; Wesbey, William H.; and Riederer, Stephen J., to General Electric Company. Line-locked digital fluorography system. 4,496,985, Cl. 358-111.000.
Jensen, James W.: *See*—
Haake, Joseph R.; Fowler, Tracy J.; and Jensen, James W., 4,496,417, Cl. 156-361.000.
Jidosha Kiki Co., Ltd.: *See*—
Hibino, Sadanobu, 4,495,854, Cl. 91-438.000.
Jo, Yasunori: *See*—
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, 4,495,841, Cl. 81-430.000.
Jodar, Francisco Y.; and Arcas, Agustin A., to D. Agustin Amador Arcas Y Nipor S.A. Incubator for piglets. 4,495,892, Cl. 119-16.000.
Joffe, Frederick M.; and Dysart, John K., to Procter & Gamble Company, The. Method of using a composite waste-containment garment having disposable elasticized insert. 4,496,360, Cl. 604-397.000.
Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,495,700, Cl. 33-1.00N.
John P. Gnaedinger Research Corporation: *See*—
Gnaedinger, John P., 4,496,267, Cl. 404-82.000.
Johns Hopkins University, The: *See*—
Silver, David M.; and Dehaas, Newman, 4,496,073, Cl. 220-445.000.
Johnson, David W., to Goodyear Tire & Rubber Company, The. Conveyor for a combine harvester. 4,495,755, Cl. 56-364.000.
Johnson, Dell A.; and Bolieau, Christopher W., to Thiokol Corporation. Dual-thrust nozzle apparatus for rockets. 4,495,763, Cl. 60-242.000.
Johnson, Russell W.: *See*—
Urban, Peter; and Johnson, Russell W., 4,496,371, Cl. 48-197.00R.
Johnson Service Company: *See*—
Froehling, Paul H.; Anders, Jude R.; Strojny, Lawrence J.; and Rehberger, James M., 4,497,031, Cl. 364-505.000.
Johnston, Christian W.: *See*—
Gould, Francis E.; and Johnston, Christian W., 4,496,535, Cl. 424-19.000.

Johnston, Otis: *See*—
Porter, James A., Jr.; Shivers, Joe D.; Rozycki, Marek; and Johnston, Otis, 4,496,015, Cl. 180-9.260.
Jones, Derrick F.: *See*—
Yellin, Tobias O.; Gilman, David J.; Edwards, Philip N.; Large, Michael S.; Jones, Derrick F.; and Oldham, Keith, 4,496,571, Cl. 514-340.000.
Jones, Howard: *See*—
Huang, Fu-chih; Jones, Howard; Lin, Clara; and Loev, Bernard, 4,496,541, Cl. 514-2.000.
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, 4,496,542, Cl. 514-2.000.
Jones, Joseph W.; and Bishop, Edward W. Horseshoe. 4,496,002, Cl. 168-4.000.
Jones, Maurice S., to Smiths Industries Public Limited Company. Indicator instruments. 4,495,806, Cl. 73-182.000.
Jones, Warren C.: *See*—
Dery, Ronald A.; Jones, Warren C.; Lynn, William J.; and Rowlette, John R., 4,496,422, Cl. 156-306.600.
Jonsson, Karl E.; and Lindgren, Gosta, to ASEA Aktiebolag. Electromagnetically operated electric switch. 4,496,920, Cl. 335-201.000.
Jopt, Uwe; and Eder, Hans, to Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. KG. Drawing head for a drawing machine. 4,495,708, Cl. 33-438.000.
Jorgensen, Jorgen A., to Northland Aluminum Products, Inc. Microwave browning utensil. 4,496,815, Cl. 219-10.55E.
Joy, Robert: *See*—
Gordon, Gary B.; Joy, Robert; and Lee, Michael J., 4,496,886, Cl. 318-254.000.
Junek, Jan; Vorbornik, Vaclay; Ripka, Josef; Jaros, Frantisek; Lihtarova , Ludmila; Hortlik, Frantisek; Kotrba, Zdenek; Rehackova, Bozena; and Dvorak, Ladislav, to Vyzkumny ustav bavlnarsky. Apparatus for separating fibers in open-end spinning units. 4,495,762, Cl. 57-411.000.
Jung, Michel: *See*—
Bey, Philippe; and Jung, Michel, 4,496,588, Cl. 514-564.000.
Junghans, Rudi, to Heidelberger Druckmaschinen AG. Ink knife and adjusting device therefor on an ink duct of a rotary printing machine. 4,495,864, Cl. 101-365.000.
Jungman, Emil A., to Jungman, Inc. Lifting device and method. 4,496,277, Cl. 414-589.000.
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Jungman, Emil A., 4,496,277, Cl. 414-589.000.
Jurriens, Theodorus K.: *See*—
Bruynes, Cornelis A.; and Jurriens, Theodorus K., 4,496,720, Cl. 544-29.000.
Justus, Edgar J., to Beloit Corporation. Dryer section drive arrangement for paper making machines. 4,495,711, Cl. 34-23.000.
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Kabashima, Katsuhiko: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,496,850, Cl. 307-269.000.
KabiVitrum AB: *See*—
Lindahl, Ulf P. F.; Backstrom, Gudrun E.; and Thunberg, John Y. L., 4,496,550, Cl. 514-54.000.
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Murakami, Muneo; and Ishizaki, Zentaro, 4,495,855, Cl. 92-71.000.
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Manabe, Masatoshi; and Miyake, Toshio, 4,496,603, Cl. 426-577.000.
Kabushiki Kaisha Kito: *See*—
Maeda, Kazuo, 4,496,136, Cl. 254-350.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Akiyama, Teruo; and Morita, Koichi, 4,495,767, Cl. 60-436.000.
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Ikeda, Masayuki, 4,496,977, Cl. 358-148.000.
Ota, Tomio; Miyasaka, Mamoru; and Hiraga, Imao, 4,496,246, Cl. 368-88.000.
Kabushiki Kaisha Takuma: *See*—
Shigaki, Masanobu, 4,495,872, Cl. 110-190.000.
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Suzuki, Masaru; Iwata, Masayosi; Hayashi, Yoshikazu; and Yokoyama, Tadashi, 4,496,810, Cl. 200-61.540.
Kaganov, Alan L.: *See*—
Ritter, Thomas A.; Kaganov, Alan L.; and Budris, John P., 4,496,446, Cl. 204-159.140.
Kainsinger, Willis C.: *See*—
Schwager, Frederic A.; and Kainsinger, Willis C., 4,496,100, Cl. 238-10.00R.
Kaise, Tatsuo, to Okamura Corporation. Industrial robot equipped with articulated arm unit. 4,496,278, Cl. 414-735.000.
Kajita, Kohji: *See*—
Nakayama, Takashi; Kajita, Kohji; and Yamagata, Selichi, 4,495,761, Cl. 57-328.000.
Kali und Salz AG: *See*—
Loblich, Karl-Richard, 4,496,526, Cl. 423-306.000.
Kallmeyer, James D.: *See*—
Funk, David B.; Kallmeyer, James D.; and Harker, Wesley H., 4,496,907, Cl. 324-445.000.
Kamat, Dattatraya V., to Crown Textile Company. Composite interlining material. 4,495,661, Cl. 2-97.000.
Kaminski, Elton G., to Stolle Corporation, The. Alignment gage for dish antenna. 4,495,706, Cl. 33-333.000.
Kammerer, Jerry L.: *See*—
Haarstad, Richard O.; and Kammerer, Jerry L., 4,496,460, Cl. 210-132.000.
Kamo, Roy, to Cummins Engine Company, Inc. Combustion chamber components for internal combustion engines. 4,495,907, Cl. 123-193.00C.
Kamoda, Hiroyoshi, to Komori Printing Machinery Co., Ltd. Plate clamping device of web-fed rotary printing press. 4,495,865, Cl. 101-415.100.
Kamstra, Paulus R., to Duphar International Research B.V. Multiple-compartment syringe. 4,496,344, Cl. 604-90.000.
Kanazawa, Yuzo: *See*—
Tanizaki, Hiroyuki; Ebihara, Sakae; Hatanaka, Akimitsu; Ogawa, Takayoshi; and Kanazawa, Yuzo, 4,496,189, Cl. 297-63.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, 4,496,611, Cl. 427-160.000.
Kaneko, Hideo; Kumashiro, Hatuyoshi; and Iwata, Akira, to Kawasaki Jukogyo Kabushiki Kaisha. Horizontal continuous casting method. 4,495,982, Cl. 164-452.000.
Kaneko, Kenji, to Victor Company of Japan, Ltd. Noise immune data regenerating circuit for video signal reproduction. 4,496,994, Cl. 358-336.000.
Kaneko, Tomonori; Mori, Shunji; Ichikawa, Tetsuo; Hiroki, Yoichi; and Kariya, Takashi, to Hitachi, Ltd. Cooling method and apparatus for hermetic type control box. 4,495,780, Cl. 62-229.000.
Kanner, Bernard; Hopper, Steven P.; and Sepelak, Dennis J., to Union Carbide Corporation. Silyl carbamates and synthesis thereof. 4,496,754, Cl. 556-420.000.
Kanno, Akihiko: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,561, Cl. 514-209.000.
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,574, Cl. 514-195.000.
Kanzaki Paper Mfg., Co., Ltd.: *See*—
Kawai, Hirokazu; and Takahashi, Fumio, 4,496,824, Cl. 219-216.000.
Kanzaki, Yoshiharu: *See*—
Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, 4,496,951, Cl. 343-394.000.
Kao Soap Co., Ltd.: *See*—
Kita, Katsuhiko; Fukuda, Junzo; and Kawahito, Shiro, 4,496,509, Cl. 264-175.000.
Kapiloff, Anita G.; and Hatch, Randolph T., to B. F. Goodrich Company, The. Cleaning composition. 4,496,470, Cl. 252-181.000.
Karami, Hamzeh; Delvaux, Myriam; and Cooper, Terence, to Colgate-Palmolive Company. Diaper having variable density absorbent pad. 4,496,358, Cl. 604-379.000.
Karasaki, Toshihiko: *See*—
Nanba, Yasuhiro; Gotoh, Takayuki; Yamakawa, Eiji; and Karasaki, Toshihiko, 4,496,834, Cl. 250-211.00R.
Kariya, Takashi: *See*—
Kaneko, Tomonori; Mori, Shunji; Ichikawa, Tetsuo; Hiroki, Yoichi; and Kariya, Takashi, 4,495,780, Cl. 62-229.000.
Karl Schmidt GmbH: *See*—
Sander, Wilfried; and Mielke, Siegfried, 4,495,684, Cl. 29-156.50R.
Karlheinz, Farber: *See*—
Nelzow, Hartmann; Karlheinz, Farber; and Deininger, Anton, 4,496,078, Cl. 222-87.000.
Karlsson, Gunvor B. T.: *See*—
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,496,367, Cl. 44-51.000.
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Waki, Masahiko; Umezawa, Seiji; Takasugi, Tsuneji; Koide, Hiroshi; and Kasai, Takao, 4,496,248, Cl. 368-280.000.
Kashdan, David S., to Eastman Kodak Company. Process for the preparation of N-(2-(cyclo-hexen-1-yl)ethyl)-4-methoxybenzeneacetamide. 4,496,762, Cl. 564-170.000.
Kashiwagi, Hiromi: *See*—
Yamashita, Keitaro; and Kashiwagi, Hiromi, 4,496,240, Cl. 355-14.00D.
Kashiwagi, Kazuo; and Shirai, Masanari, to Canon Kabushiki Kaisha. Web transport device. 4,496,117, Cl. 242-191.000.
Kashiwaya, Mineo; and Yamada, Kinsaku, to Hitachi, Ltd. Air flow meter assembly. 4,495,802, Cl. 73-118.000.
Kasper, Willi; Licht, Helmut; Raquet, Erwin; and Schneider, Jurgen, to Krupp Stahl Aktiengesellschaft. Vibration-damped wheel for rail vehicles. 4,496,183, Cl. 295-7.000.
Kasuga, Akira; Hibino, Noburo; and Miyatsuka, Hajime, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,496,626, Cl. 428-336.000.
Kataoka, Hiroshi. Winding shaft provided on surface with spool fixing rollers. 4,496,114, Cl. 242-68.200.
Kato, Choji: *See*—
Ohishi, Kishiro; and Kato, Choji, 4,496,111, Cl. 242-55.000.
Kato, Kentaro: *See*—
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Kato, Takaaki; Kato, Takeshi; and Yoshizawa, Yoshikazu, to Nippondenso Co., Ltd.; Systemkiki Co., Ltd.; and Fuji Xerox Co., Ltd. Apparatus for managing a group of copying machines. 4,497,037, Cl. 364-900.000.

Kato, Takaaki; Hirano, Yoshio; Ochiai, Takeshi; Ishikawa, Seizi; and Sakai, Kazunori, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Motor vehicle diagnostic monitoring system. 4,497,057, Cl. 371-29.000.

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Katsura, Tadashi: *See*—
Minai, Masayoshi; and Katsura, Tadashi, 4,496,767, Cl. 568-346.000.

Katz, David H.; Cooper, Steven W.; Lee, Theodore T.; and Chang, Shung-Ho, to Quidel. Detection of HCG with solid phase support having avidin coating. 4,496,654, Cl. 435-7.000.

Katzen, Stanley J.: *See*—
Rekers, Louis J.; and Katzen, Stanley J., 4,496,699, Cl. 526-105.000.

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Kaufman, Robert J.: *See*—
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Kavanau, Lawrence: *See*—
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Kawabata, Takashi: *See*—
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,496,832, Cl. 250-201.000.

Kawabe, Norio; Tsuda, Mikio; and Kobashi, Sadao, to Toray Industries, Inc. Treatment of image-forming laminated plate. 4,496,647, Cl. 430-303.000.

Kawade, Tateo: *See*—
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Kawaguchi, Akio: *See*—
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Kawahito, Shiro: *See*—
Kita, Katsuhiko; Fukuda, Junzo; and Kawahito, Shiro, 4,496,509, Cl. 264-175.000.

Kawai, Hirokazu; and Takahashi, Fumio, to Shinko Electric Co., Ltd.; and Kanzaki Paper Mfg., Co., Ltd. Method for controlling temperature of heat generating element of thermal printing head and circuit for practising same. 4,496,824, Cl. 219-216.000.

Kawai, Hiromu: *See*—
Hitotsuyanagi, Hajime; Fujita, Nobuhiko; Itozaki, Hideo; and Kawai, Hiromu, 4,496,450, Cl. 204-192.00R.

Kawai, Hisasi: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,496,134, Cl. 251-65.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,495,847, Cl. 84-1.010.

Kawai, Shuji: *See*—
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, 4,496,714, Cl. 528-272.000.

Kawakatsu, Ichiro. Process for producing a tin/lead alloy solder joint with less wetting agent residue. 4,496,098, Cl. 228-219.000.

Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for improving weather resistant adhesion of a coating to glass surface. 4,496,611, Cl. 427-160.000.

Kawamo, Kazunori: *See*—
Tuchiya, Yoshimasa; Chikaraishi, Takayo; and Kawamo, Kazunori, 4,496,186, Cl. 296-146.000.

Kawamura, Hideaki: *See*—
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Kawamura, Mikio: *See*—
Ishii, Sugao; Itou, Susumu; Kawamura, Mikio; and Tsukamoto, Tadashi, 4,496,063, Cl. 212-270.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kaneko, Hideo; Kumashiro, Hatuyoshi; and Iwata, Akira, 4,495,982, Cl. 164-452.000.

Kawasaki Steel Corporation: *See*—
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Ishii, Sugao; Itou, Susumu; Kawamura, Mikio; and Tsukamoto, Tadashi, 4,496,063, Cl. 212-270.000.

Kawashima, Ryoji; Usagawa, Akira; and Masuda, Takayoshi, to Mitsui Toatsu Chemicals, Inc. Saccharide fatty acid ester for bloat-prevention or bloat-treatment. 4,496,547, Cl. 514-25.000.

Kawate, Keith W.; and Strachan, Richard W., deceased (by Strachan, Dawne C., executrix), to Texas Instruments Incorporated. Universal single phase motor starting control apparatus. 4,496,895, Cl. 318-781.000.

Kawate, Kenji: *See*—
Yamada, Shunsuke; Kawate, Kenji; Ono, Takashi; Arakawa, Hideo; and Suda, Tsuyoshi, 4,496,312, Cl. 432-11.000.

Kay, Nicholas W.: *See*—
Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., 4,496,875, Cl. 313-632.000.

KB Cold Isostatic Press Systems CIPS: *See*—
Pettersson, Ola, 4,496,299, Cl. 425-405.00H.

Keller, Frederick P.; and Zwiep, Theodore C., to Cascade Engineering, Inc. Rotary vibration isolator bushing. 4,496,332, Cl. 464-89.000.

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Kemper, Yves J., to Ipanema Company. Power drive line having a wide range of speed ratios. 4,495,829, Cl. 74-191.000.

Kenda, Rajko. Apparatus for separately catching successive streams of urine at taking samples to laboratorial and bacteriological examination. 4,495,951, Cl. 128-762.000.

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Andresen, Bernhard H.; Schenck, Stephen R.; and Kennedy, Nathan R., 4,496,914, Cl. 331-110.000.

Kenney Manufacturing Company: *See*—
Comeau, Paul E.; and Torti, Anthony, 4,495,671, Cl. 16-87.00R.

Kerkhof, Matheus W.: *See*—
Hermens, Joannes L. G.; and Kerkhof, Matheus W., 4,496,842, Cl. 250-385.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Behr, Friedrich; Schulten, Rudolf; and Weirich, Walter, 4,496,373, Cl. 55-16.000.
Stockmeyer, Rolf, 4,495,900, Cl. 123-1.00A.

Key Concepts, Incorporated: *See*—
Smith, William D., 4,496,803, Cl. 200-5.00A.

Key Pharmaceuticals, Inc.: *See*—
Bodor, Nicholas S., 4,496,570, Cl. 514-282.000.

Keystone International, Inc.: *See*—
Scobie, William B., 4,496,135, Cl. 251-308.000.

Khan, Aman U., to Whirlpool Corporation. Double-acting refrigerator door hinge with dual latch members. 4,495,673, Cl. 16-232.000.

Khrenov, Jury A.: *See*—
Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., 4,496,868, Cl. 310-112.000.

Kilfeather, James F., Jr.: *See*—
Hanson, John R.; Hauser, James L.; Kilfeather, James F., Jr.; and Hendriks, Hendrik B., 4,496,793, Cl. 174-68.500.

Kilkson, Henn, to Du Pont de Nemours, E. I., and Company. Platelet storage container. 4,496,361, Cl. 604-408.000.

Kim, Sun K., to Biomeasure, Inc. Therapeutic compounds. 4,496,540, Cl. 514-19.000.

Kimizuka, Junichi: *See*—
Tsukada, Masaharu; Kimizuka, Junichi; and Shimizu, Haruo, 4,496,238, Cl. 355-14.00D.

Kimura, Kenji, to Olympus Optical Co. Ltd. Technique for controlling tracking in an optical disc apparatus. 4,497,048, Cl. 369-46.000.

Kimura, Tadashi: *See*—
Nakamura, Toshiyuki; Inaba, Tsutomu; and Kimura, Tadashi, 4,496,293, Cl. 417-371.000.

Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., to Olin Corporation. Process and apparatus for synchronized electromagnetic casting of multiple strands. 4,495,981, Cl. 164-452.000.

Kindlmann, Peter J.; Ungarean, Gary L.; Yarwood, John C.; and Tyler, Derek E., to Olin Corporation. Determination of liquid-solid interface and head in electromagnetic casting. 4,495,983, Cl. 164-452.000.

Kinetronic Industries, Inc.: *See*—
D'Antonio, Nicholas F.; Knabel, Walter; and Stempfhuber, Lorenz, 4,496,168, Cl. 280-612.000.

King, Oswald M. Peristaltic pumps. 4,496,295, Cl. 417-477.000.

King, Paul F.: *See*—
Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, 4,496,944, Cl. 340-723.000.

King, Peter F., to Parker Chemical Company. Composition and process for treatment of ferrous substrates. 4,496,404, Cl. 148-6.14R.

King-Seeley Thermos Co.: *See*—
Marks, James R., 4,496,087, Cl. 222-638.000.

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Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,465, Cl. 252-79.200.
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,466, Cl. 252-79.300.

Kingen, Rickey W.; and Duncan, Robert H., to International Telephone and Telegraph Corporation. Handsfree telephone instrument using digital dial. 4,496,799, Cl. 179-100.00L.

Kinjo, Hisao: *See*—
Wada, Yoshiyo; Goto, Kunio; and Kinjo, Hisao, 4,497,052, Cl. 369-126.000.

Kinman, Darry M.: *See*—
Bowling, Donald R.; Kinman, Darry M.; Afendykiw, Marko; and White, David J., 4,497,030, Cl. 364-481.000.

Kinoshita, Harumi; Kushida, Hideo; Itakura, Takeshi; Akutsu, Masao; Takada, Takuzo; and Sugiura, Hiroaki, to Yoshino Kogyosho Co. Ltd. Process for preparing saturated polyester resin bottles. 4,496,517, Cl. 264-521.000.

Kinoshita, Takao: *See*—
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,496,832, Cl. 250-201.000.

Kira, Hideshi: *See*—
Kitagawa, Kazuo; Endoh, Kenjiro; and Kira, Hideshi, 4,496,937, Cl. 340-347.0SH.

Kira, Masaaki: *See*—
Kobayashi, Yukio; Kira, Masaaki; and Yamaguchi, Kinya, 4,496,640, Cl. 429-213.000.
Kirchner, Balthasar; and Siegfried, Schleicher, to Ernst Stadelmann Gesellschaft m.b.H. Case for holding flat articles. 4,496,050, Cl. 206-444.000.
Kirin Beer Kabushiki Kaisha: *See*—
Nakamura, Katsumi; and Kitamura, Kumpei, 4,496,656, Cl. 435-209.000.
Kirita, Kei; and Koike, Katuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for producing metal ions. 4,496,843, Cl. 250-426.000.
Kirkham, Stanley W.: *See*—
McLoughlin, Robert H.; and Kirkham, Stanley W., 4,496,616, Cl. 428-36.000.
Kirkland, Edmund R.; Palanuik, Elko; and Ingman, Harlan V. Product and method of making a seed coating for increased yield. 4,495,724, Cl. 47-57.600.
Kirkpatrick, John D.: *See*—
Brittain, Perry N.; and Kirkpatrick, John D., 4,496,499, Cl. 264-36.000.
Kirnbauer, Peter: *See*—
Linke, Walter; Kirnbauer, Peter; and Indra, Rudolf, 4,496,501, Cl. 264-37.000.
Kirton, John: *See*—
Cattell, Alan F.; Cockayne, Brian; Wright, Peter J.; and Kirton, John, 4,496,610, Cl. 427-66.000.
Kish, Arthur S., to Murray Corporation. Accumulator dehydrator. 4,496,378, Cl. 55-316.000.
Kish, Louis G.: *See*—
Dugan, Elmo A.; Kish, Louis G.; Miller, Edwin J.; and Fabian, George J., 4,496,159, Cl. 273-341.000.
Kishi, Hiroyasu: *See*—
Sakamoto, Junji; and Kishi, Hiroyasu, 4,496,978, Cl. 358-155.000.
Kist, William J., to Combined Fluid Products Company. Pneumatic control system. 4,495,968, Cl. 137-624.200.
Kita, Katsuhiko; Fukuda, Junzo; and Kawahito, Shiro, to Narumi China Corporation; and Kao Soap Co., Ltd. Method of producing ceramic tapes. 4,496,509, Cl. 264-175.000.
Kitagaki, Tetsuo: *See*—
Sakato, Naoyuki; and Kitagaki, Tetsuo, 4,496,506, Cl. 264-109.000.
Kitagawa, Kazuo; Endoh, Kenjiro; and Kira, Hideshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Sampled signal generation circuit. 4,496,937, Cl. 340-347.0SH.
Kitajima, Koji: *See*—
Tsuchihashi, Genichi; Mitamura, Shuichi; Kitajima, Koji; and Kobayashi, Kumi, 4,496,755, Cl. 560-028.000.
Kitakami, Hazime; Ishikawa, Hiroshi; Tezuka, Masayoshi; Adachi, Susumu; and Makinouchi, Akifumi, to Fujitsu Limited. Join operation processing system in relational model. 4,497,039, Cl. 364-900.000.
Kitamura, Kumpei: *See*—
Nakamura, Katsumi; and Kitamura, Kumpei, 4,496,656, Cl. 435-209.000.
Kitts, Earle L., Jr.: *See*—
Haugh, Eugene F.; Kitts, Earle L., Jr.; and Mickewich, Daniel J., 4,496,652, Cl. 430-569.000.
Kiyokawa, Morio, to Mitsubishi Denki Kabushiki Kaisha. Numerical control device. 4,497,029, Cl. 364-474.000.
Klauke, Erich: *See*—
Kuhle, Engelbert; Brandes, Wilhelm; Rosslenbroich, Hans-Jurgen; and Klauke, Erich, 4,496,575, Cl. 514-390.000.
Kleemann, Axel: *See*—
Bergstein, Wolfgang; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,496,729, Cl. 544-336.000.
Kleemann, Heinz-Werner: *See*—
Hoppe, Dieter; and Kleemann, Heinz-Werner, 4,496,723, Cl. 544-90.000.
Klett, Rolf. Apparatus for measuring jaw movement. 4,495,952, Cl. 128-777.000.
Klingenfeld, Dietmar: *See*—
Schorcht, Adelbrecht; Klingenfeld, Dietmar; Hesse, Reiner; Dastis, Rainer; and Linz, Volker, 4,496,970, Cl. 358-101.000.
Klockner-Humboldt-Deutz AG: *See*—
Noack, Horst-Gunter, 4,496,281, Cl. 415-111.000.
Steinbiss, Eberhard; Herchenbach, Horst; Ramesohl, Hubert; and Wolter, Albrecht, 4,496,396, Cl. 106-100.000.
Knabel, Walter: *See*—
D'Antonio, Nicholas F.; Knabel, Walter; and Stempfhuber, Lorenz, 4,496,168, Cl. 280-612.000.
Knapp, Richard P., to Kavanau, Lawrence, a part interest. Biasing method for improved performance in field effect devices. 4,496,909, Cl. 330-277.000.
Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,496,271, Cl. 410-105.000.
Kobashi, Sadao: *See*—
Kawabe, Norio; Tsuda, Mikio; and Kobashi, Sadao, 4,496,647, Cl. 430-303.000.
Kobayashi, Kumi: *See*—
Tsuchihashi, Genichi; Mitamura, Shuichi; Kitajima, Koji; and Kobayashi, Kumi, 4,496,755, Cl. 560-028.000.
Kobayashi, Makoto, to Canon Kabushiki Kaisha. Stepping motor control apparatus. 4,496,891, Cl. 318-696.000.
Kobayashi, Nobuyuki; and Hattori, Takashi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling the fuel supply of an internal combustion engine. 4,495,926, Cl. 123-486.000.
Kobayashi, Nobuyuki: *See*—
Shinoda, Kazuo; and Kobayashi, Nobuyuki, 4,495,915, Cl. 123-357.000.
Kobayashi, Takashi: *See*—
Yoshihara, Setsuo; Otsubo, Yorihumi; and Kobayashi, Takashi, 4,496,830, Cl. 235-458.000.
Kobayashi, Tsukasa: *See*—
Yamamoto, Tamio; Kobayashi, Tsukasa; Hirakawa, Tadashi; Yoshida, Makoto; and Okumura, Masumi, 4,496,583, Cl. 428-288.000.
Kobayashi, Yukio; Kira, Masaaki; and Yamaguchi, Kinya, to Showa Denko Kabushiki Kaisha. Battery having acetylene high polymer electrode. 4,496,640, Cl. 429-213.000.
Kochevar, Rudolph J. Method of weighting an article. 4,496,153, Cl. 273-80.800.
Kodama, Kazuyuki: *See*—
Yabuuchi, Shigeru; Endoh, Takeyuki; Kodama, Kazuyuki; and Ide, Jushi, 4,497,035, Cl. 364-577.000.
Kodric, Andrej A. Wind turbine. 4,496,283, Cl. 416-44.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Michalik, Horst B., 4,496,338, Cl. 493-367.000.
Koerner, Hans-Gerhard; Lang, Helmut; Berthold, Rainer; Strietzel, Rainer; and Melchior, Friedrich, to Brown, Boveri & Cie AG. Apparatus for setting and/or monitoring the operation of a shell fuse or detonator. 4,495,851, Cl. 89-6.500.
Kogami, Kunio: *See*—
Matsui, Masanao; Chun-Eng, Liau; Kogami, Kunio; Yano, Toshihiko; and Matsuo, Noritada, 4,496,586, Cl. 514-531.000.
Koh-I-Noor Rapidograph, Inc.: *See*—
Brandt, Joachim; Deblitz, Gerhard; Post, Jurgen; Willimczik, Bernd; Marten, Rolf; Paschen, Rolf; and Anderka, Gerold, 4,496,958, Cl. 346-139.00R.
Kohketsu, Kazuo: *See*—
Umemoto, Chiyuki; and Kohketsu, Kazuo, 4,496,838, Cl. 250-327.200.
Koide, Hiroshi: *See*—
Waki, Masahiko; Umezawa, Seiji; Takasugi, Tsuneji; Koide, Hiroshi; and Kasai, Takao, 4,496,248, Cl. 368-280.000.
Koike, Katuo: *See*—
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Kojima, Koichi: *See*—
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Kojima, Noboru: *See*—
Shibata, Akira; Konosu, Makoto; Tamura, Teizo; Hirose, Koichi; Miura, Kuniaki; Kojima, Noboru; and Komatsu, Keiichi, 4,497,004, Cl. 360-108.000.
Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See*—
Masaki, Mikio; Nara, Etuo; Shimizu, Keiichi; and Fukasawa, Takeshi, 4,495,786, Cl. 70-186.000.
Kollberg, Sten, to ASEA Aktiebolag. Continuous casting mold stirring. 4,495,984, Cl. 164-468.000.
Koller, Rudolf: *See*—
Horler, Hansulrich; and Koller, Rudolf, 4,496,252, Cl. 384-215.000.
Koltun, Harry M., to Arrow Container & Packaging Corp. Corner protector for containerized article. 4,496,054, Cl. 206-586.000.
Komatsu, Keiichi: *See*—
Shibata, Akira; Konosu, Makoto; Tamura, Teizo; Hirose, Koichi; Miura, Kuniaki; Kojima, Noboru; and Komatsu, Keiichi, 4,497,004, Cl. 360-108.000.
Terada, Toshimichi; Komatsu, Keiichi; Shibata, Akira; and Satoh, Kenji, 4,497,000, Cl. 360-70.000.
Komatsu, Osamu: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Nagasaka, Mitsuaki; and Nakamura, Yoshiki, 4,496,735, Cl. 546-301.000.
Komori Printing Machinery Co., Ltd.: *See*—
Kamoda, Hiroyoshi, 4,495,865, Cl. 101-415.100.
Kondo, Koichi; Iwasa, Susumu; and Yoshida, Isamu, to Takeda Chemical Industries, Ltd. Method for enzyme immunoassay and production of antibody. 4,496,658, Cl. 436-510.000.
Kondo, Mitsuru: *See*—
Yuasa, Kazuhiro; Takahashi, Shuichi; and Kondo, Mitsuru, 4,496,987, Cl. 358-283.000.
Konietzny, Alfred: *See*—
Zagefka, Hans-Dieter; Bartz, Wilfried; and Konietzny, Alfred, 4,496,613, Cl. 427-440.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Funahashi, Soukichi, 4,497,010, Cl. 361-93.000.
Itoh, Toyotsugu; and Muramatsu, Toshio, 4,496,209, Cl. 350-6.800.
Konnik, Robert P., to Harvey Hubbell Incorporated. Electrical cable splicing system. 4,496,795, Cl. 174-84.00R.
Konno, Kunio; and Okada, Masashi, to Nippon Kogaku K.K. Light illumination device. 4,497,015, Cl. 362-268.000.
Konosu, Makoto: *See*—
Shibata, Akira; Konosu, Makoto; Tamura, Teizo; Hirose, Koichi; Miura, Kuniaki; Kojima, Noboru; and Komatsu, Keiichi, 4,497,004, Cl. 360-108.000.
Kontz, Robert F., to Owens-Illinois, Inc. Methods and machines for placing and heating oriented plastic heat-shrinkable sleeves on containers. 4,496,409, Cl. 156-85.000.
Kopp, Richard; Grogler, Gerhard; Reiff, Helmut; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Aromatic diisocyanates containing N,N-disubstituted sulfonamide groups and processes for their production. 4,496,491, Cl. 260-453.0AR.
Koppers Company, Inc.: *See*—
Leston, Gerd, 4,496,774, Cl. 568-784.000.

Kotlewski, Witold: *See*—
Krecisz, Maria; Kotlewski, Witold; and Bebenkowski, Krzysztof, 4,496,930, Cl. 338-26.000.

Kotowski, Thomas W., to General Motors Corporation. Power transistor protection from substrate injection. 4,496,849, Cl. 307-254.000.

Kotrba, Zdenek: *See*—
Junek, Jan; Vorbornik, Vaclay; Ripka, Josef; Jaros, Frantisek; Lihtarova , Ludmila; Hortlik, Frantisek; Kotrba, Zdenek; Rehackova, Bozena; and Dvorak, Ladislav, 4,495,762, Cl. 57-411.000.

Kovach, Stephen M.: *See*—
Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,496,665, Cl. 502-521.000.

Kovacs, Gregory J.: *See*—
Tam, Man C.; and Kovacs, Gregory J., 4,496,642, Cl. 430-41.000.

Kowalski, Robert J.; and Wilmoth, William C. Illuminated sight for aiming a bow. 4,495,705, Cl. 33-265.000.

Kozawa, Tadashi, to Aisan Industry Co., Ltd. Canister for volatile fuel controlling device. 4,496,379, Cl. 55-387.000.

Krabetz, Richard: *See*—
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Lucas, Ekhart; Merger, Franz; and Nees, Friedbert, 4,496,770, Cl. 568-463.000.

Kramer, Dan H., to Atari, Inc. Digital-analog conversion for shaft encoders. 4,496,936, Cl. 340-347.00P.

Kraus, Theodore C., to Olin Corporation. Preparation of metal cyanates from alkyl carbamates. 4,496,529, Cl. 423-365.000.

Krauter, Immanuel; and Schweizer, Hartmut, to Robert Bosch GmbH. Engine ignition system. 4,495,931, Cl. 123-651.000.

Krautzberger, Franz: *See*—
Wohrle, Albert; and Krautzberger, Franz, 4,495,888, Cl. 118-410.000.

Krecisz, Maria; Kotlewski, Witold; and Bebenkowski, Krzysztof, to Politechnika Warszawska. In-line fire detector of a fire protection and alarm system. 4,496,930, Cl. 338-26.000.

Kreft, John R.; and Moss, Elvis W., to Brunswick Corporation. Ratchet spring. 4,496,115, Cl. 242-84.10R.

Kreinbrink, Paul H.: *See*—
Hymore, Frank J.; and Kreinbrink, Paul H., 4,496,386, Cl. 65-106.000.

Krieger, Friedrich, to Gg. Noell GmbH. Gripper system for load transport. 4,496,182, Cl. 294-81.00R.

Krishnakumar, Suppayan M.: *See*—
Beck, Martin H.; and Krishnakumar, Suppayan M., 4,496,064, Cl. 215-1.00C.

Krob, Erwin; Leichtfried, Friedrich; and Bauer, Helmut, to TMC Corporation. Heel holder combined with a ski brake. 4,496,167, Cl. 280-605.000.

Krogstad, Ivar, to A/S Pusnes Marine and Offshore Services. Hawser attachment. 4,495,882, Cl. 114-230.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Kronseder, Hermann; and Schneider, Egon, 4,496,040, Cl. 198-434.000.

Kronimus & Sohn GmbH & Co. KG: *See*—
Ruckstuhl, Willi, 4,496,266, Cl. 404-41.000.

Kronseder, Hermann; and Schneider, Egon, to Krones AG Hermann Kronseder Maschinenfabrik. Apparatus for widening and slowing down a stream of upright bottles. 4,496,040, Cl. 198-434.000.

Krooss, Robert J. Bottle alignment apparatus. 4,496,039, Cl. 198-396.000.

Krupp Stahl Aktiengesellschaft: *See*—
Kasper, Willi; Licht, Helmut; Raquet, Erwin; and Schneider, Jurgen, 4,496,183, Cl. 295-7.000.

Krusche, Alfred, to Linde Aktiengesellschaft. Controls for hydrostatic systems. 4,495,766, Cl. 60-428.000.

Krusius, J. Peter: *See*—
Nulman, Jaime; and Krusius, J. Peter, 4,496,419, Cl. 156-643.000.

Ku, Audrey Y.; Chupp, John P.; and Balthazor, Terry M., to Monsanto Company. Preparation of 2-(methylthiomethyl)-6-(trifluoromethyl-)aniline from ortho-aminobenzotrifluoride. 4,496,765, Cl. 564-440.000.

Kubiatowicz, James F., to Custom Concepts, Incorporated. Water jet toy. 4,496,329, Cl. 446-167.000.

Kubo, Hirofumi; and Fujimori, Toshiyuki, to Hitachi, Ltd. Molded coil structure. 4,496,926, Cl. 336-205.000.

Kuch, Philip L., to Standard Oil Company, The. Process for the production of hydrogen and carbonyl sulfide from hydrogen sulfide and carbon monoxide using a precious metal promoted metal oxide/sulfide catalyst. 4,496,531, Cl. 423-416.000.

Kuch, Philip L.: *See*—
McGuiggan, Michael F.; and Kuch, Philip L., 4,496,530, Cl. 423-416.000.

Kudva, Balakrishna V.: *See*—
Mistretta, Charles A.; Peppler, Walter W.; Kudva, Balakrishna V.; Hasegawa, Bruce H.; and Dobbins, James T., III, 4,497,062, Cl. 378-158.000.

Kueny, Cindee C., to Zenith Electronics Corporation. Unipotential electron gun for short cathode ray tubes. 4,496,877, Cl. 315-15.000.

Kuhle, Engelbert; Brandes, Wilhelm; Rosslenbroich, Hans-Jurgen; and Klauke, Erich, to Bayer Aktiengesellschaft. Fungicidal N-sulphenylated hydantoins. 4,496,575, Cl. 514-390.000.

Kuhn, Patrick: *See*—
Sagaser, Thomas M.; Kuhn, Patrick; and Brock, Knute K., 4,495,770, Cl. 60-486.000.

Kuhn S.A.: *See*—
Oberle, Edmond; Wattron, Bernard; and Hironimus, Jeannot, 4,496,107, Cl. 241-101.700.

Kulavich, David P.: *See*—
Davies, Richard A.; Lee, Michael W.; Rodenberger, Frank A.; Hill, James R.; Kulavich, David P.; and Sowell, Donald L., 4,496,411, Cl. 156-136.000.

Kulesa, Edmund M.: *See*—
Winkless, Robert A.; and Kulesa, Edmund M., 4,496,069, Cl. 220-260.000.

Kulkarni, Sudhir S.; and Kulprathipanja, Santi, to UOP Inc. Process for separating unsaponifiables from fatty and rosin acids. 4,496,478, Cl. 260-97.600.

Kulke, Gunter: *See*—
Grauel, Ingolf; Hofer, Gerald; Kulke, Gunter; and Stumpe, Werner, 4,496,192, Cl. 303-13.000.

Kulprathipanja, Santi: *See*—
Kulkarni, Sudhir S.; and Kulprathipanja, Santi, 4,496,478, Cl. 260-97.600.

Kumabe, Junichiro; and Kumabe, Masaru, to Kumabe, Masaru. Vibration method for cutting teeth. 4,496,321, Cl. 433-215.000.

Kumabe, Masaru: *See*—
Kumabe, Junichiro; and Kumabe, Masaru, 4,496,321, Cl. 433-215.000.

Kumada, Akio, to Hitachi, Ltd. Display device with transparent cover as a vibrator of a sound generator. 4,496,247, Cl. 368-255.000.

Kumashiro, Hatuyoshi: *See*—
Kaneko, Hideo; Kumashiro, Hatuyoshi; and Iwata, Akira, 4,495,982, Cl. 164-452.000.

Kunifumi, Sawamoto, to Nissan Motor Company, Limited. Electronic control system for an internal combustion engine controlling air/fuel ratio depending on atmospheric air pressure. 4,495,921, Cl. 123-438.000.

Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, to Nippon Soken, Inc. Heading detecting apparatus. 4,497,034, Cl. 364-571.000.

Kuno, Nobuyoshi; and Honda, Kiyokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Sealed beam type reflective lamp. 4,496,872, Cl. 313-113.000.

Kuraray Co., Ltd.: *See*—
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, 4,496,714, Cl. 528-272.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,561, Cl. 514-209.000.
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,574, Cl. 514-195.000.

Kurita, Atsushi, to Toshiba Silicone Co., Ltd. Silicone sealant composition. 4,496,696, Cl. 525-479.000.

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Kuroda, Shigeharu. Scaffold plank. 4,496,029, Cl. 182-222.000.

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Lenz, John O., 4,496,139, Cl. 269-81.000.

Kurtz, Robert J.; and LiCausi, Joseph, to Bioresearch. Orthopedic foot splint with swivel. 4,495,943, Cl. 128-80.00A.

Kushida, Hideo: *See*—
Kinoshita, Harumi; Kushida, Hideo; Itakura, Takeshi; Akutsu, Masao; Takada, Takuzo; and Sugiura, Hiroaki, 4,496,517, Cl. 264-521.000.

Kusmierz, Marvin A.; and Pijaszek, Robert F., to Ultra Carbon Corporation. Susceptor assembly. 4,496,828, Cl. 219-405.000.

Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinivasa, to Canadian Patents & Development Limited. Method of gelling a gelation shrinkable, polymer casting solution. 4,496,502, Cl. 264-41.000.

Kuwahara, Rikiya; Habuto, Akinaka; and Oiso, Hisayoshi, to Meiji Seika Kaisha, Ltd. Process for producing chewing gum in the form of composite fibers. 4,496,592, Cl. 426-5.000.

Kuyel, Birol, to AT&T Technologies, Inc. Technique for determining the end point of an etching process. 4,496,425, Cl. 156-626.000.

Kwan, Henry K., to Schering Corporation. Biologically stable alpha-interferon formulations. 4,496,537, Cl. 424-85.000.

Kwikform America, Inc.: *See*—
Meehan, Richard G., 4,496,026, Cl. 182-128.000.

Kwok, Sai W.: *See*—
Yu, Hong; and Kwok, Sai W., 4,496,979, Cl. 358-197.000.

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Gelbein, Abraham P.; and Kwon, Joon T., 4,496,752, Cl. 549-521.000.
Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., 4,496,777, Cl. 568-850.000.

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Kwon, Ki C., to Bendix Corporation, The. Linear motion bearing truck and rail assembly. 4,496,197, Cl. 308-6.00C.

Kyriacou, Demetrios: *See*—
Campbell, Kent D.; Gulbenkian, Aylin H.; Edamura, Fred Y.; and Kyriacou, Demetrios, 4,496,440, Cl. 204-78.000.

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Laarhoven, Franciscus L., 4,496,263, Cl. 403-402.000.

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Marandet, Andre J. P.; and Charbonnier, Marc, 4,496,867, Cl. 310-93.000.

Laboratoire Roger Bellon: *See*—
Matsumoto, Jun-ichi; and Nakamura, Shinichi, 4,496,566, Cl. 514-254.000.

LaFleur, Paul J., Jr.: *See*—
Crescenzo, Francis C.; and LaFleur, Paul J., Jr., 4,495,745, Cl. 53-77.000.

LaGrone, James H.: *See*—
Beasley, Roy D.; and LaGrone, James H., 4,495,803, Cl. 73-151.000.

Lahut, Joseph A.; and Popelish, John A., to General Electric Company. High resolution magnetic printing head. 4,496,962, Cl. 346-74.500.

Lai, Ching C.: *See*—
Schoenig, Frederick C., Jr.; Grossman, Leonard N.; Lai, Ching C.; Masaitis, William; and Canada, Robert O., 4,496,056, Cl. 209-539.000.

Lai, John T., to BF Goodrich Company, The. Preparation of nitroalcohols. 4,496,772, Cl. 568-704.000.

Laiteris Hubert Triballat: *See*—
Caille, Michel, 4,496,593, Cl. 426-89.000.

Lamontagne, Andre . Automobile shelter. 4,495,736, Cl. 52-63.000.

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Coppersmith, Ward J.; and LaMotte, George B., III, 4,496,657, Cl. 435-287.000.

Lampert, Barry: *See*—
Hwang, Chong S.; and Lampert, Barry, 4,496,320, Cl. 433-60.000.

Landis, Abraham L., to Hughes Aircraft Company. Process for preparing isoimide containing oligomers. 4,496,711, Cl. 528-125.000.

Lane, Samuel H., Jr. Container and lid forming a disposable mold. 4,496,070, Cl. 220-306.000.

Laney, William R.: *See*—
Pate, Harold T.; Laney, William R.; and Shell, Donald H., 4,495,970, Cl. 138-148.000.

Lang, Helmut: *See*—
Koerner, Hans-Gerhard; Lang, Helmut; Berthold, Rainer; Strietzel, Rainer; and Melchior, Friedrich, 4,495,851, Cl. 89-6.500.

Lang, Michael: *See*—
Ferguson, Douglas M.; Owens, William M.; Lang, Michael; and Lincoln, Jay P., 4,496,045, Cl. 206-63.300.

Lange, Paul H., Jr., to Olin Corporation. Process for making carbohydrazide. 4,496,761, Cl. 564-37.000.

Langer, William J., to MTS Systems Corporation. Robot arm and wrist assembly. 4,496,279, Cl. 414-735.000.

Lanier, Jack K. Foot warmer. 4,495,935, Cl. 126-204.000.

LaPointe, Gary S.: *See*—
Cerankowski, Leon D.; LaPointe, Gary S.; and Mattucci, Neil C., 4,496,651, Cl. 430-490.000.

Laramie, Roland A. Extendable support. 4,496,123, Cl. 248-121.000.

Large, Michael S.: *See*—
Yellin, Tobias O.; Gilman, David J.; Edwards, Philip N.; Large, Michael S.; Jones, Derrick F.; and Oldham, Keith, 4,496,571, Cl. 514-340.000.

Larkin, William A., to M&T Chemicals Inc. Non-toxic organotin stabilizers for vinyl chloride polymers. 4,496,490, Cl. 260-429.700.

Larsen, Richard R., to Pacific Scientific Company. Automatic bellows welder and method for using same. 4,496,097, Cl. 228-212.000.

Larsen, Verlyn N., to Design Concepts, Inc. Hanging devices for pictures and the like. 4,496,128, Cl. 248-496.000.

Lasley, Duncan T.: *See*—
Jegers, Viktor J.; and Lasley, Duncan T., 4,496,822, Cl. 219-125.100.

Lau, Edward H.; and Colonel, Kenneth, to Primages, Inc. Method and apparatus for mounting a daisy print wheel on the shaft of a print head. 4,496,254, Cl. 400-175.000.

Le Carbone-Lorraine: *See*—
Hubert, Jean-Marie; Bauer, Jean-Michel; and Mollet, Serge, 4,496,621, Cl. 428-236.000.

Leach, Douglas R., to Hercules Incorporated. Method of making cellular crosslinked poly(dicyclopentadiene). 4,496,669, Cl. 521-93.000.

Leary, Michael J.: *See*—
Reichgott, David W.; and Leary, Michael J., 4,496,667, Cl. 521-26.000.

Lebedev, Nikolai I.: *See*—
Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., 4,496,868, Cl. 310-112.000.

Le Blanc, Helmut; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the preparation of alkyl-substituted anilines. 4,496,763, Cl. 564-402.000.

Le Blanc Smith, Guy; and Howard, Derik, to Grathnail Development Company Limited. Method of and apparatus for mining analysis. 4,495,804, Cl. 73-152.000.

Lee, George E.; and Lee, Thomas B. K., to Hoechst-Roussel Pharmaceuticals Inc. Stereoselective reduction of 2- or 3-substituted 4-piperidones with sodium borohydride. 4,496,732, Cl. 546-216.000.

Lee, Hong H.; and Miller, Dennis J., to University of Florida. Method and apparatus for determining relative surface areas of a coated material on a substrate. 4,496,249, Cl. 374-7.000.

Lee, Kyu H., to Extracorporeal Medical Specialties, Inc. Dialysis apparatus and technique. 4,496,458, Cl. 210-90.000.

Lee, Michael J.: *See*—
Gordon, Gary B.; Joy, Robert; and Lee, Michael J., 4,496,886, Cl. 318-254.000.

Lee, Michael W.: *See*—
Davies, Richard A.; Lee, Michael W.; Rodenberger, Frank A.; Hill, James R.; Kulavich, David P.; and Sowell, Donald L., 4,496,411, Cl. 156-136.000.

Lee, Theodore T.: *See*—
Katz, David H.; Cooper, Steven W.; Lee, Theodore T.; and Chang, Shung-Ho, 4,496,654, Cl. 435-7.000.

Lee, Thomas B. K.: *See*—
Lee, George E.; and Lee, Thomas B. K., 4,496,732, Cl. 546-216.000.

Leeke, Gordon; Chu, Chaokang; and Dailey, Nils L., to AMF Incorporated. Chromatography column. 4,496,461, Cl. 210-198.200.

Leiber, Heinz: *See*—
Braschel, Volker; Emig, Reiner; Leiber, Heinz; Mendel, Michael; and Gerstenmeier, Jurgen, 4,497,026, Cl. 364-426.000.

Leichtfried, Friedrich: *See*—
Krob, Erwin; Leichtfried, Friedrich; and Bauer, Helmut, 4,496,167, Cl. 280-605.000.

Leisure Technology, Inc.: *See*—
McNamara, George, 4,496,816, Cl. 219-10.55E.

Leiter, Raymond J. Curtain bow. 4,496,059, Cl. 211-105.100.

Lemer, Joseph. Artificial breathing device. 4,495,946, Cl. 128-204.250.

Leningradskoe Proizvodstvennoe Elektromachinostroitelnoe Obiedinenie "Elektrosila": *See*—
Antonov, Jury F.; Iogansen, Vadim I.; Tkachenko, Alexei S.; Chernyavsky, Vladimir P.; and Shapiro, Aron B., 4,496,870, Cl. 310-260.000.

Lenko, Daniel S.: *See*—
Rozner, Alexander G.; Lenko, Daniel S.; and Carter, James H., 4,495,848, Cl. 89-1.100.

Lennon, Donald J.: *See*—
Beaudet, Leo A.; and Lennon, Donald J., 4,496,236, Cl. 355-3.0DR.

Lenox, Ronald S.: *See*—
Ehrhart, Wendell A.; Lenox, Ronald S.; and Sparks, Moses, Jr., 4,496,674, Cl. 523-500.000.

Lenz, John O., to Kurt Manufacturing Company, Inc. Vise clamp and swivel base vise using such clamp. 4,496,139, Cl. 269-81.000.

Lenz, Michael, to Siemens Aktiengesellschaft. Integrated amplifier circuit. 4,496,911, Cl. 330-297.000.

Lenzing, Richard S., to Superior Electric Company, The. Electrical device with improved heat dissipation. 4,496,923, Cl. 336-59.000.

Leppard, David G.; and Rody, Jean, to Ciba-Geigy AG. Color-photographic recording material. 4,496,649, Cl. 430-372.000.

Lerouge, Claude P. H.: *See*—
Colardelle, Joel S. G.; Lerouge, Claude P. H.; and Loup, Nicole J. R., 4,496,798, Cl. 179-84.00T.

Le Roy, Pierre: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,496,560, Cl. 514-204.000.

Lesche, Wolfgang: *See*—
Diepold-Scharnitzky, Rudolf; Lesche, Wolfgang; and Rindfleisch, Volker, 4,497,038, Cl. 364-900.000.

Leston, Gerd, to Koppers Company, Inc. Complex formed to separate nitrated phenolic compounds from other phenolic compounds. 4,496,774, Cl. 568-784.000.

L'Etat Francais, Represente par Le Ministre des P.T.A. (Centre National D'Etudes des Telecommunications): *See*—
Noirel, Maurice Y., 4,496,975, Cl. 358-147.000.

Leurink, Hendrik J., to Stichtig Centraal Laboratorium Van De Bloedtrasfusiedienst Van Het Nederlandse Rode Kruis. Container for liquids for use in medicine and surgery. 4,496,362, Cl. 604-408.000.

Le Vantine, Allan D. An electrostatic air cleaning device having ionization apparatus which causes the air to flow therethrough. 4,496,375, Cl. 55-131.000.

Lever Brothers Company: *See*—
SenGupta, Achintya K., 4,496,489, Cl. 260-428.500.

Levin, Arthur L.: *See*—
Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; Hankison, Ronald L.; Hao, Ming C.; Levin, Arthur L.; McClain, George A.; Wanish, Paul J.; and Zeitler, Carl, Jr., 4,497,022, Cl. 364-200.000.

Levine, Peter A., to RCA Corporation. Compensation against field shading in video from field-transfer CCD imagers. 4,496,982, Cl. 358-221.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal heterocyclic alkylaminocarbonylsulfonamides. 4,496,392, Cl. 71-93.000.

Lewandowski, James: *See*—
McEver, James P.; and Lewandowski, James, 4,496,162, Cl. 277-9.500.

Lewis, U. James, to Whittier Institute for Diabetes and Endocrinology, The. Insulin-potentiating peptides. 4,496,521, Cl. 514-12.000.

Lgz Landis & Gyr Zug Ag: *See*—
Halder, Mathis, 4,496,932, Cl. 338-49.000.

Libbey-Owens-Ford Company: *See*—
Hymore, Frank J.; and Kreinbrink, Paul H., 4,496,386, Cl. 65-106.000.

LiCausi, Joseph: *See*—
Kurtz, Robert J.; and LiCausi, Joseph, 4,495,943, Cl. 128-80.00A.

Licht, Helmut: *See*—
Kasper, Willi; Licht, Helmut; Raquet, Erwin; and Schneider, Jurgen, 4,496,183, Cl. 295-7.000.

Liebert, Karl-Heinz: *See*—
Tischer, Werner; Liebert, Karl-Heinz; and Fassbender, Rolf, 4,495,769, Cl. 60-451.000.
Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,495,746, Cl. 53-389.000.
Liegner, Kenneth B. Bite block. 4,495,945, Cl. 128-200.260.
Lienhard, Paul: *See*—
Iqbal, Abul; and Lienhard, Paul, 4,496,727, Cl. 544-225.000.
Liggett, Paul E., to Goodyear Aerospace Corporation. Polyurethane and method for making stable components thereof. 4,496,707, Cl. 528-61.000.
Lightolier Incorporated: *See*—
Woloski, Leonard E.; and Wyles, Walter E., 4,497,014, Cl. 362-150.000.
Lihtarova , Ludmila: *See*—
Junek, Jan; Vorbornik, Vaclay; Ripka, Josef; Jaros, Frantisek; Lihtarova , Ludmila; Hortlik, Frantisek; Kotrba, Zdenek; Rehackova, Bozena; and Dvorak, Ladislav, 4,495,762, Cl. 57-411.000.
Lill, Helmut; Schrenk, Jurgen; and Wunderwald, Peter, to Boehringer Mannheim GmbH. Process for the determination of antithrombin-BM. 4,496,653, Cl. 435-7.000.
Lima Electric Co., Inc.: *See*—
Unnewehr, Lewis E.; Walker, Robert B.; and Szippl, Andrew F., 4,496,897, Cl. 322-25.000.
Limb, David I.: *See*—
Hubbard, Colin; Limb, David I.; and Duckett, Melvyn, 4,496,383, Cl. 62-31.000.
Lin, Clara: *See*—
Huang, Fu-chih; Jones, Howard; Lin, Clara; and Loev, Bernard, 4,496,541, Cl. 514-2.000.
Lin, David C. K., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing a continuous glass filament mat. 4,496,384, Cl. 65-4.400.
Lin, David C. K., to Owens-Corning Fiberglas Corporation. Apparatus for producing a continuous glass filament mat. 4,496,385, Cl. 65-9.000.
Lincoln, Jay P.: *See*—
Ferguson, Douglas M.; Owens, William M.; Lang, Michael; and Lincoln, Jay P., 4,496,045, Cl. 206-63.300.
Lincoln Manufacturing Company, Inc.: *See*—
Bratton, Ronald E., 4,495,932, Cl. 126-20.000.
Lindahl, Ulf P. F.; Backstrom, Gudrun E.; and Thunberg, John Y. L., to KabiVitrum AB. Oligosaccharides having selective anticoagulation activity. 4,496,550, Cl. 514-54.000.
Lindberg, Eric T.; and Friedman, Anna M., to Atlas Copco Aktiebolag. Pneumatically operated impact tool. 4,496,023, Cl. 181-230.000.
Lindberg, Steven E.: *See*—
Caspari, Gunter J.; and Lindberg, Steven E., 4,496,495, Cl. 260-989.000.
Linde Aktiengesellschaft: *See*—
Krusche, Alfred, 4,495,766, Cl. 60-428.000.
Lindemann, Harley B.: *See*—
Tisdale, Glenn E.; and Lindemann, Harley B., 4,497,065, Cl. 382-1.000.
Lindemann, Rolf W. Method of producing briquettes from organic waste products. 4,496,365, Cl. 44-1.00D.
Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, to Robert Bosch GmbH. Polarographic sensor and sensing system for determining oxygen content in gases. 4,496,455, Cl. 204-412.000.
Lindgren, Gosta: *See*—
Jonsson, Karl E.; and Lindgren, Gosta, 4,496,920, Cl. 335-201.000.
Lindmayer, Istvan: *See*—
Crevier, Paul H.; and Lindmayer, Istvan, 4,496,090, Cl. 227-19.000.
Lindstrom, Wictor C. O., to Credence Finance Association. Sill and frame for windows or doors. 4,495,726, Cl. 49-401.000.
Linke, Walter; Kirnbauer, Peter; and Indra, Rudolf, to Wienerberger Baustoffindustrie Aktiengesellschaft. Process and apparatus for the production of articles consisting of ceramic material. 4,496,501, Cl. 264-37.000.
Linz, Volker: *See*—
Schorcht, Adelbrecht; Klingenfeld, Dietmar; Hesse, Reiner; Dastis, Rainer; and Linz, Volker, 4,496,970, Cl. 358-101.000.
Lippitt, David L.; and Walker, Loren H., to General Electric Company. Control for a force commutated current source var generator. 4,496,899, Cl. 323-207.000.
Lippmann, K. Reiner; and Dorgeloh, K. Heinrich W., to Deutache Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt e.v. Method for the representation of video images or scenes, in particular aerial images transmitted at reduced frame rate. 4,496,972, Cl. 358-109.000.
Litton Resources Systems, Inc.: *See*—
Porter, James A., Jr.; Shivers, Joe D.; Rozycki, Marek; and Johnston, Otis, 4,496,015, Cl. 180-9.260.
Litton Systems, Inc.: *See*—
Hradek, Richard W., 4,496,376, Cl. 55-163.000.
Loblich, Karl-Richard, to Kali und Salz AG. Process for the production of potassium magnesium phosphate. 4,496,526, Cl. 423-306.000.
Locher, Engelbert: *See*—
Hartmann, Ludwig; Ruzek, Ivo; and Locher, Engelbert, 4,496,508, Cl. 264-167.000.
Lockheed Corporation: *See*—
Zsolnay, Andrew; Perkins, Kelly M.; and Blad, Leiv H., 4,496,697, Cl. 526-60.000.
Lockheed Electronics Co., Inc.: *See*—
Yang, John P., 4,497,060, Cl. 375-22.000.
Lockwood, Michael. Combination spacer and lifting device for backhoe machinery. 4,495,717, Cl. 37-117.500.
Loeffler, Herbert H.: *See*—
DeCloux, Richard J.; Loeffler, Herbert H.; MacConkey, James S.; and Yonkers, E. Hubbard, 4,496,147, Cl. 272-130.000.
Loev, Bernard: *See*—
Huang, Fu-chih; Jones, Howard; Lin, Clara; and Loev, Bernard, 4,496,541, Cl. 514-2.000.
Lognion, Leon. Anal excretion collecting rectal catheter. 4,496,356, Cl. 604-328.000.
Loizeau, Pierre, to Valeo. Torsional dampers. 4,496,036, Cl. 192-106.200.
Lojko, Jozef; and Miller, Richard L., to Lojko, Jozef. Jogger speedometer and odometer. 4,495,813, Cl. 73-490.000.
Loncrini, Donald F.; Haag, Thomas E.; and Freebersyser, Steven R., to Mallinckrodt, Inc. Compositions of p-hydroxybenzoic acid esters and methods of preparation and use. 4,496,576, Cl. 514-389.000.
Longamore, Robert G., to Electron Beam Corporation. Separable high vacuum valve. 4,495,966, Cl. 137-614.010.
Longpre , Francois; Longpre , Yves; and Longpre , Pierre. Prefabricated concrete panel with truss. 4,495,688, Cl. 29-460.000.
Longpre , Pierre: *See*—
Longpre , Francois; Longpre , Yves; and Longpre , Pierre, 4,495,688, Cl. 29-460.000.
Longpre , Yves: *See*—
Longpre , Francois; Longpre , Yves; and Longpre , Pierre, 4,495,688, Cl. 29-460.000.
Lonza Ltd.: *See*—
Quarroz, Daniel, 4,496,733, Cl. 546-310.000.
Lordi, Frank E., to Atlantic Richfield Company. Fire retardant concentrate. 4,496,681, Cl. 524-371.000.
Loubier, Robert J., to Xolox Corporation. Method of fabricating a permanent magnet. 4,496,303, Cl. 425-569.000.
Loup, Nicole J. R.: *See*—
Colardelle, Joel S. G.; Lerouge, Claude P. H.; and Loup, Nicole J. R., 4,496,798, Cl. 179-84.00T.
Lowery, Jack R., Sr.; and Payet, George L., to Springs Industries, Inc. Apparatus and process for ultrasonically cutting off predetermined widths of selvages and sealing the cut edges of textile fabric. 4,496,407, Cl. 156-73.300.
Lu, Wei C.: *See*—
Ateya, Antoun I.; and Lu, Wei C., 4,496,644, Cl. 430-122.000.
Lubchenko, Eugene; Hoke, Leander H., Jr.; and Burton, Richard J., to U.S. Philips Corporation. Subscription television interface. 4,496,986, Cl. 358-114.000.
Lucas, Ekhart: *See*—
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Lucas, Ekhart; Merger, Franz; and Nees, Friedbert, 4,496,770, Cl. 568-463.000.
Lucas Industries: *See*—
Dawes, Cyril; and Smith, John D., 4,496,401, Cl. 148-16.500.
Lucas Industries Limited: *See*—
Campbell, Graeme R., 4,496,888, Cl. 318-284.000.
Lucasfilm Ltd.: *See*—
Moorer, James A., 4,497,023, Cl. 364-200.000.
Luck, Harald. Fluorescent lamp ballast. 4,496,880, Cl. 315-228.000.
Ludwig, Albert R., to General Signal Corporation. Small volume mixing and recirculating apparatus. 4,496,244, Cl. 366-136.000.
Luk Lamellen und Kupplungsbau GmbH: *See*—
Reik, Wolfgang, 4,496,137, Cl. 267-161.000.
Lummus Company, The: *See*—
Gelbein, Abraham P.; and Kwon, Joon T., 4,496,752, Cl. 549-521.000.
Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., 4,496,777, Cl. 568-850.000.
Lummus Crest, Inc.: *See*—
Kwon, Joon T.; and Suciu, George D., 4,496,753, Cl. 549-521.000.
Lustenberger, Hans, to George Fischer Limited. Immersion and vaporization chamber. 4,496,393, Cl. 75-58.000.
Luther, Thomas A.: *See*—
Kwon, Ki C.; and Luther, Thomas A., 4,496,195, Cl. 308-6.00C.
Lynn, Gary. Window escape device. 4,495,728, Cl. 49-141.000.
Lynn, William J.: *See*—
Dery, Ronald A.; Jones, Warren C.; Lynn, William J.; and Rowlette, John R., 4,496,422, Cl. 156-306.600.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Despot, Janko; and Abendroth, Paul, 4,495,863, Cl. 101-350.000.
M&T Chemicals Inc.: *See*—
Larkin, William A., 4,496,490, Cl. 260-429.700.
MacConkey, James S.: *See*—
DeCloux, Richard J.; Loeffler, Herbert H.; MacConkey, James S.; and Yonkers, E. Hubbard, 4,496,147, Cl. 272-130.000.
Machida, Shigeru: *See*—
Arai, Nobukatsu; Machida, Shigeru; Sato, Eiji; Tojo, Kenji; and Uchikawa, Naoshi, 4,496,296, Cl. 418-55.000.
Machida, Takeshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Contact lens holder. 4,496,243, Cl. 356-244.000.
Machler, Meinrad; Sachse, Richard; Stacklies, Horst; and Schindler, Achim, to Carl-Zeiss-Stiftung. Method and apparatus for adjusting and mounting optical components in optical instruments. 4,496,416, Cl. 156-293.000.
Mack, Michael H.; Corley, Sterling C.; and Cole, Leland G. Method for electrically introducing substances into liquid solution. 4,496,443, Cl. 204-130.000.
MacLean, David; and Edwards, Robert B., II, to Viridian, Inc. Feeding tube stylet. 4,496,347, Cl. 604-164.000.

Madnick, Herman; and Goldman, Ralph F., to Multi-Tech Corporation. Cold-weather muff. 4,495,659, Cl. 2-66.000.

Maeda, Kazuo, to Kabushiki Kaisha Kito. Hoist. 4,496,136, Cl. 254-350.000.

Maeda, Tooru; and Yajima, Tsunao, to Mazda Motor Corporation. Exhaust gas recirculation system for diesel engines. 4,495,929, Cl. 123-569.000.

Maenishi, Kozo; Adachi, Masaaki; and Bando, Yoshihide, to Omron Tateisi Electronics Co. Electric contact switching device. 4,496,806, Cl. 200-16.00R.

Maeyama, Sadao; Dochi, Kiyotaka; and Honda, Shigemichi, to Sony Corporation. Apparatus for thermal printing. 4,496,955, Cl. 346-76.0PH.

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Furukawa, Teruo, 4,496,934, Cl. 340-347.0DD.
Futatsuishi, Shunichi; Fujita, Shozo; and Takushima, Takashi, 4,495,719, Cl. 40-590.000.
Iwaki, Yoshiyuki; Yokota, Mitsuyoshi; and Matsumoto, Akio, 4,496,898, Cl. 322-34.000.
Kiyokawa, Morio, 4,497,029, Cl. 364-474.000.
Matsumoto, Akio, 4,496,336, Cl. 474-181.000.
Morishita, Akira; Tanaka, Toshinori; Matsumoto, Kouichi; and Gotou, Takeo, 4,495,905, Cl. 123-179.00F.
Nakamura, Toshiyuki; Inaba, Tsutomu; and Kimura, Tadashi, 4,496,293, Cl. 417-371.000.
Ogawa, Hitoshi, 4,496,297, Cl. 418-133.000.
Sawatani, Kenji, 4,496,863, Cl. 310-61.000.
Sugimoto, Hiroshi, 4,495,801, Cl. 73-117.000.
Tsubouchi, Natsuro; and Denda, Masahiko, 4,496,964, Cl. 357-30.000.
Yamamoto, Sakuei; Nishida, Mitsuhiro; Tashiro, Noboru; and Sonoda, Nobuo, 4,496,866, Cl. 310-87.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sugio, Akitoshi; Masu, Masanobu; and Matunaga, Masatugu, 4,496,695, Cl. 525-391.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Kawashima, Ryoji; Usagawa, Akira; and Masuda, Takayoshi, 4,496,547, Cl. 514-25.000.
Mitsuishi, Toshiro, to Honda Giken Kogyo Kabushiki Kaisha. V-Type multi-cylinder engine for motorcycle. 4,496,020, Cl. 180-219.000.
Mitsuka, Ikuo, to Dainippon Screen Manufacturing Co., Ltd. Aperture mask for image scanning and recording system. 4,496,956, Cl. 346-108.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Nakadoi, Tetsuya, 4,495,701, Cl. 33-166.000.
Sakata, Hideo; and Saito, Masami, 4,495,703, Cl. 33-174.00L.
Sakata, Hideo, 4,496,807, Cl. 200-61.420.
Miura, Isao: *See*—
Miura, Takao; and Miura, Isao, 4,496,102, Cl. 239-227.000.
Miura, Kuniaki: *See*—
Shibata, Akira; Konosu, Makoto; Tamura, Teizo; Hirose, Koichi; Miura, Kuniaki; Kojima, Noboru; and Komatsu, Keiichi, 4,497,004, Cl. 360-108.000.
Miura Machinery Works Co., Ltd.: *See*—
Miura, Takao; and Miura, Isao, 4,496,102, Cl. 239-227.000.
Miura, Shigetaka; Igawa, Junichi; and Takata, Satoru, to Yokogawa Hokushin Electric Corporation. Taut band type instrument suitable for automatical assembly. 4,496,902, Cl. 324-150.000.
Miura, Takao; and Miura, Isao, to Miura Machinery Works Co., Ltd. Cleaning apparatus. 4,496,102, Cl. 239-227.000.
Miyahara, Kingo, to Dowa Company, Ltd. Method of heating and packaging food. 4,496,594, Cl. 426-234.000.
Miyake, Toshio: *See*—
Manabe, Masatoshi; and Miyake, Toshio, 4,496,603, Cl. 426-577.000.
Miyaki, Masahiko: *See*—
Matsumura, Toshimi; Miyaki, Masahiko; Tomishima, Hitoshi; and Masuda, Akira, 4,495,920, Cl. 123-436.000.
Miyasaka, Mamoru: *See*—
Ota, Tomio; Miyasaka, Mamoru; and Hiraga, Imao, 4,496,246, Cl. 368-88.000.
Miyatsuka, Hajime: *See*—
Kasuga, Akira; Hibino, Noburo; and Miyatsuka, Hajime, 4,496,626, Cl. 428-336.000.
Mizu, Kouichi: *See*—
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, 4,495,841, Cl. 81-430.000.
Mizukoshi, Kiyoshi: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Nagasaka, Mitsuaki; and Nakamura, Yoshiki, 4,496,735, Cl. 546-301.000.
Mobay Chemical Corporation: *See*—
Wenzel, Wolfgang D.; and Carmosino, Michael N., 4,496,678, Cl. 524-157.000.
Moberg, Gregory O., to Eastman Kodak Company. Power indicator apparatus for a DC to DC flyback converter. 4,496,939, Cl. 340-636.000.
Moberg, William K., to Du Pont de Nemours, E. I., and Company. Fungicidal imidazole derivatives. 4,496,551, Cl. 514-63.000.
Mobil Oil Corporation: *See*—
Beasley, Roy D.; and LaGrone, James H., 4,495,803, Cl. 73-151.000.
Chu, Chin-Chiun, 4,496,662, Cl. 502-183.000.
Park, Hee C.; and Ashcraft, Charles R., 4,496,620, Cl. 428-323.000.
Savins, Joseph G., 4,496,012, Cl. 175-65.000.
Sharps, Gordon V., Jr., 4,496,413, Cl. 156-244.130.
Moldowan, Carol: *See*—
Moldowan, Mervin J.; and Moldowan, Carol, 4,496,548, Cl. 514-27.000.
Moldowan, Mervin J.; and Moldowan, Carol. Composition and method for reducing hangover. 4,496,548, Cl. 514-27.000.
Molins PLC: *See*—
Fox, Austin L., 4,495,750, Cl. 53-575.000.
Green, Robert J.; and Hinchcliffe, Dennis, 4,496,055, Cl. 209-536.000.
Moll, Richard J. Apparatus for setting roller clearance. 4,496,339, Cl. 493-420.000.
Moller, Hinrich; Wallat, Siegfried; Hoffkes, Horst; and Giede, Karl, to Henkel Kommanditgesellschaft auf Aktien. Sebosuppressive cosmetic preparations containing long-chained alkanols and antioxidants. 4,496,536, Cl. 424-70.000.
Mollet, Serge: *See*—
Hubert, Jean-Marie; Bauer, Jean-Michel; and Mollet, Serge, 4,496,621, Cl. 428-236.000.
Monarch Marking Systems, Inc.: *See*—
Pabodie, Robert M.; and Hamisch, Paul H., Jr., 4,496,049, Cl. 206-395.000.
Moncrief, Marion L., Jr.: *See*—
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,497,033, Cl. 364-551.000.
Mondrush, Ronald L. Seat. 4,495,887, Cl. 297-118.000.
Monsanto Company: *See*—
Franz, John E.; and Kaufman, Robert J., 4,496,389, Cl. 71-86.000.
Ku, Audrey Y.; Chupp, John P.; and Balthazor, Terry M., 4,496,765, Cl. 564-440.000.
Morita, Eiichi, 4,496,683, Cl. 524-571.000.
Montedison S.p.A.: *See*—
Massardo, Pietro, 4,496,771, Cl. 568-651.000.

Mookherjee, Braja D.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,496,775, Cl. 568-820.000.
Moorehead, Eric L., to Union Oil Company of California. Hydrocarbon conversion process employing catalysts containing a molybdenum-exchanged crystalline aluminosilicate zeolite. 4,496,784, Cl. 585-486.000.
Moorer, James A., to Lucasfilm Ltd. Linked list of timed and untimed commands. 4,497,023, Cl. 364-200.000.
Moret, David M.; and Ahr, Nicholas A., to Procter and Gamble Company, The. Bib having a duplex refastenable tape-tab fastener. 4,495,658, Cl. 2-49.00R.
Morgan, Bill T.: *See*—
Mozer, Larry P.; and Morgan, Bill T., 4,496,301, Cl. 425-532.000.
Morgan, Gene L.: *See*—
Wurdack, Gerard A.; and Morgan, Gene L., 4,496,890, Cl. 318-600.000.
Morgan, Paul E., to CTI International Inc. Labyrinth ventilator. 4,495,857, Cl. 98-6.000.
Morgan, Thomas W.: *See*—
Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., 4,496,233, Cl. 355-3.0TR.
Mori, Shunji: *See*—
Kaneko, Tomonori; Mori, Shunji; Ichikawa, Tetsuo; Hiroki, Yoichi; and Kariya, Takashi, 4,495,780, Cl. 62-229.000.
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, to Matsushita Electric Industrial Co., Ltd. Automatic screwdriver. 4,495,841, Cl. 81-430.000.
Mori, Yutaka: *See*—
Nakamura, Keiichi; Inaguma, Yoshiharu; and Mori, Yutaka, 4,496,288, Cl. 417-213.000.
Moriguchi, Haruhiko; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Copying machine. 4,496,988, Cl. 358-294.000.
Morimoto, Shigeo: *See*—
Adachi, Takashi; Morimoto, Shigeo; Takahashi, Yoko; Watanabe, Yoshiaki; and Omura, Sadafumi, 4,496,717, Cl. 536-7.200.
Morimoto, Takuo; Nishiuchi, Kihachiro; Izumi, Misao; and Ejima, Noriyoshi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Heat-insulating refractory material consisting alkali titanate and silicon resin. 4,496,469, Cl. 252-62.000.
Morishita, Akira; Tanaka, Toshinori; Matsumoto, Kouichi; and Gotou, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Starting device. 4,495,905, Cl. 123-179.00F.
Morita, Eiichi, to Monsanto Company. Rubber compositions containing a vulcanization system alterative. 4,496,683, Cl. 524-571.000.
Morita, Koichi: *See*—
Akiyama, Teruo; and Morita, Koichi, 4,495,767, Cl. 60-436.000.
Moriyama, Masakazu; and Saito, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Running guide system. 4,496,996, Cl. 360-12.000.
Morley, John G., to BCIRA. Binders for foundry cores and moulds. 4,495,980, Cl. 164-16.000.
Morrill, Charles D.: *See*—
Roche, Joseph R.; Morrill, Charles D.; and Hynes, Joseph H., 4,496,173, Cl. 285-24.000.
Morris, James B. N. Hydril-type connector. 4,496,175, Cl. 285-334.000.
Morris, James V.: *See*—
Frohlich, Sigurd; and Morris, James V., 4,496,420, Cl. 156-643.000.
Morscheck, Timothy J., to Eaton Corporation. Trimmer valve. 4,495,837, Cl. 74-869.000.
Morscheck, Timothy J., to Eaton Corporation. Transmission shift valve. 4,495,839, Cl. 74-869.000.
Morsing, Gijsbertus B., to Daisy Systems, Holland B.V. Impact hammer. 4,496,253, Cl. 400-163.100.
Morssinkhof, Gerhardus H., to Stork Screens B.V. Process of electroforming a metal product and an electroformed metal product. 4,496,434, Cl. 204-11.000.
Morstain, Barry R.; and Danner, Melvin F., to Morstain, Barry R. Sporting event analysis device. 4,496,148, Cl. 273-1.00E.
Moschovis, Elias P.: *See*—
Ansel, Robert E.; Cutler, Orvid R.; and Moschovis, Elias P., 4,496,210, Cl. 350-96.300.
Moser, Peter: *See*—
Bender, Franz; Hertweck, Gernot; Grohn, Michael; and Moser, Peter, 4,495,906, Cl. 123-188.0GC.
Moss, Elvis W.: *See*—
Kreft, John R.; and Moss, Elvis W., 4,496,115, Cl. 242-84.10R.
Mosteller, Thomas F., to Air-Shields, Inc. Infusion monitoring apparatus. 4,496,346, Cl. 604-123.000.
Motojima, Kenji, to Hitachi, Ltd. Oxine impregnated activated charcoal metal ion adsorbent. 4,496,664, Cl. 502-402.000.
Motorola, Inc.: *See*—
Bai, Monty W.; and Meyer, Alfred B., 4,495,792, Cl. 73-12.000.
Oliver, Kirk D.; and Wolff, David A., 4,496,882, Cl. 315-371.000.
Smith, Michael D., 4,496,858, Cl. 307-519.000.
Mott, Jonathan C. Racquets with protective bumper strip. 4,496,152, Cl. 273-73.00C.
Mottler Instrumente AB: *See*—
Willi, Ernst, 4,496,014, Cl. 177-187.000.
Motycka, Jiri, to Imasco-CDC Research Foundation. High speed medical ventilator. 4,495,947, Cl. 128-205.140.
Moutonnier, Claude: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,496,560, Cl. 514-204.000.
Mozer, Larry P.; and Morgan, Bill T., to Phillips Petroleum Company. Plastic molding apparatus. 4,496,301, Cl. 425-532.000.
Mrotzek, Dieter: *See*—
Redeker, Detmar; and Mrotzek, Dieter, 4,496,340, Cl. 494-29.000.
MSK-Verpackungs-Systeme GmbH: *See*—
Hannen, Rainer W., 4,496,310, Cl. 431-350.000.
MTS Systems Corporation: *See*—
Langer, William J., 4,496,279, Cl. 414-735.000.
Mucha, Franz: *See*—
Habelt, Gerhard; and Mucha, Franz, 4,496,257, Cl. 400-578.000.
Muchowski, Joseph M.; and Guzman, Angel, to Syntex (U.S.A.) Inc. Imidazolidinone prostaglandins, compositions and use. 4,496,577, Cl. 514-392.000.
Mueller Steam Specialty, A Division of Core Industries, Inc.: *See*—
Desai, Ashvin D.; and Bujack, Alvin, 4,496,463, Cl. 210-341.000.
Muller, Jurgen: *See*—
Thate, Kurt; Farber, Heinrich; and Muller, Jurgen, 4,496,273, Cl. 414-411.000.
Muller, Klaus: *See*—
Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,496,455, Cl. 204-412.000.
Muller, Michael; Giers, Alfred; and Heiland, Manfred, to Carl Schenck AG:. Correlation procedure and device for rotor balancing. 4,495,811, Cl. 73-462.000.
Multi-Tech Corporation: *See*—
Madnick, Herman; and Goldman, Ralph F., 4,495,659, Cl. 2-66.000.
Munch, Peter. Die plate for granulation pressing, particularly for the manufacture of feed granules. 4,496,298, Cl. 425-192.00R.
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., to International Flavors & Fragrances Inc. Insect repellent, pheremonal, animal repellent diagnostic and/or aroma augmenting or enhancing compositions and articles containing at least a major proportion of poly(epsilon caprolactone)homopolymers, and having imbedded therein one or more functional. 4,496,467, Cl. 252-92.000.
Munz, Gerta H., executrix: *See*—
Asher, William P.; and Munz, Otto J., deceased, 4,496,328, Cl. 441-55.000.
Munz, Otto J., deceased: *See*—
Asher, William P.; and Munz, Otto J., deceased, 4,496,328, Cl. 441-55.000.
Murakami, Muneo; and Ishizaki, Zentaro, to Showa Precision Machinery Co., Ltd.; and Kabushiki Kaisha Ecti Kenkyusho. Reciprocating type oil-free gas compressor. 4,495,855, Cl. 92-71.000.
Muramatsu, Toshio: *See*—
Itoh, Toyotsugu; and Muramatsu, Toshio, 4,496,209, Cl. 350-6.800.
Murata Kikai Kabushiki Kaisha: *See*—
Tone, Syoichi; Deno, Koji; and Matsushima, Akio, 4,496,108, Cl. 242-18.0PW.
Murata Manufacturing Co., Ltd.: *See*—
Sumita, Manabu; and Yamashita, Toshiaki, 4,496,871, Cl. 310-324.000.
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, to Kuraray Co., Ltd. Polyester, adhesives comprising the same, and laminates and laminated hollow vessels made thereof. 4,496,714, Cl. 528-272.000.
Murphy, Donald P., to Parker Chemical Company. Compound and process for denaturing high solids paints. 4,496,374, Cl. 55-84.000.
Murphy, Gerard P.: *See*—
Schrekeis, Josef; and Murphy, Gerard P., 4,496,165, Cl. 279-46.00R.
Murray Corporation: *See*—
Kish, Arthur S., 4,496,378, Cl. 55-316.000.
Musikas, Claude: *See*—
Bonnin, Michelle; Musikas, Claude; and Vitorge, Pierre, 4,496,523, Cl. 423-9.000.
Musschoot, Albert, to General Kinematics Corporation. Vibratory apparatus. 4,495,826, Cl. 74-87.000.
Mustoe, Robert M.: *See*—
Ptasienski, Mitchell P.; Mustoe, Robert M.; and Zajonc, Fred H., deceased, 4,496,515, Cl. 264-504.000.
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cephalosporin derivative. 4,496,561, Cl. 514-209.000.
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Penicillin derivative. 4,496,574, Cl. 514-195.000.
Muto, Toshiaki; and Goto, Akio, to Tokico Ltd. Method for manufacturing valve guide for a hydraulic damper. 4,495,790, Cl. 72-326.000.
Myers, Albert: *See*—
Tesaarzik, Juergen M.; Myers, Albert; and Yuille, James D., 4,495,810, Cl. 73-432.00R.
Myers, Charles L.: *See*—
Grant, Thomas S.; and Myers, Charles L., 4,496,690, Cl. 525-66.000.
Myers, Richard S.; Michaelson, Robert C.; and Austin, Richard G., to Exxon Research & Engineering Co. Process for the hydroxylation of olefins using molecular oxygen, an osmium containing catalyst, a copper Co-catalyst, and an aromatic amine based promoter. 4,496,778, Cl. 568-860.000.
Myers, Richard S.; Michaelson, Robert C.; and Austin, Richard G., to Exxon Research & Engineering Co. Process for the hydroxylation of olefins using molecular oxygen, an osmium containing catalyst, a copper co-catalyst, and a cycloaliphatic amine based promoter. 4,496,779, Cl. 568-860.000.
Myotoku Ltd.: *See*—
Ise, Yoji, 4,495,965, Cl. 137-599.000.

N P S P "Novotex": *See*—
Dimitrov, Milko D., 4,495,757, Cl. 57-5.000.
Nabae, Kiyoyuki: *See*—
Adachi, Yasuo; and Nabae, Kiyoyuki, 4,496,631, Cl. 428-394.000.
Nabisco Brands, Inc.: *See*—
Michnowski, Jane, 4,496,606, Cl. 426-658.000.
Nadalin, Robert J.; and Charles, Robert G., to Westinghouse Electric Corp. Separation of isotopes of zirconium. 4,496,445, Cl. 204-158.00R.
Naegeli, Peter; and Rohr, Martin, to Givaudan Corporation. Odorants containing cis-3,7-dimethylocta-3,6-dienoic acid. 4,496,476, Cl. 252-522.00R.
Nagai, Kyozi: *See*—
Okazaki, Toshimasa; Sakata, Akihiro; Nagai, Kyozi; and Nakashima, Kazuo, 4,496,442, Cl. 204-129.000.
Nagasaka, Mitsuaki: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Nagasaka, Mitsuaki; and Nakamura, Yoshiki, 4,496,735, Cl. 546-301.000.
Nagasawa, Takashi; and Nakata, Tiaki, to Sumitomo Chemical Company, Limited; and Taoka Chemical Company, Limited. Adhesive composition. 4,496,685, Cl. 524-708.000.
Nagata, Keiji; Ueda, Syuji; and Tanigawa, Yoshiyuki, to Matsushita Electric Industrial Co., Ltd. Table sliding apparatus. 4,495,871, Cl. 108-20.000.
Nagel, David D.: *See*—
McDonald, William J.; Maurer, William C.; and Nagel, David D., 4,496,174, Cl. 285-53.000.
Nagy, David L. Key operated security cap. 4,496,065, Cl. 215-207.000.
Nakadoi, Tetsuya, to Mitutoyo Mfg. Co., Ltd. Digital indication type micrometerhead. 4,495,701, Cl. 33-166.000.
Nakai, Masaaki; Sahara, Masayoshi; Hosomizu, Hiroshi; and Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. Exposure control device for cameras. 4,496,230, Cl. 354-416.000.
Nakajima, Yasuo, to Nissan Motor Company, Limited. Fuel control system. 4,495,930, Cl. 123-575.000.
Nakamura, Katsumi; and Kitamura, Kumpei, to Kirin Beer Kabushiki Kaisha. Process for production of cellulase. 4,496,656, Cl. 435-209.000.
Nakamura, Keiichi; Inaguma, Yoshiharu; and Mori, Yutaka, to Toyoda Koki Kabushiki Kaisha. Vane type pump with a variable capacity for power steering devices. 4,496,288, Cl. 417-213.000.
Nakamura, Shinichi: *See*—
Matsumoto, Jun-ichi; and Nakamura, Shinichi, 4,496,566, Cl. 514-254.000.
Nakamura, Toshiyuki; Inaba, Tsutomu; and Kimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Compressor of the scroll type. 4,496,293, Cl. 417-371.000.
Nakamura, Yoshiki: *See*—
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Nagasaka, Mitsuaki; and Nakamura, Yoshiki, 4,496,735, Cl. 546-301.000.
Nakano, Teruo; and Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Controlling device for a brushless motor. 4,496,893, Cl. 318-721.000.
Nakashima, Fujio; Enoki, Takashi; and Nakashima, Kazuto, to Hitachi, Ltd. Function switching system for an audio/video apparatus. 4,496,947, Cl. 340-825.240.
Nakashima, Kazuo: *See*—
Okazaki, Toshimasa; Sakata, Akihiro; Nagai, Kyozi; and Nakashima, Kazuo, 4,496,442, Cl. 204-129.000.
Nakashima, Kazuto: *See*—
Nakashima, Fujio; Enoki, Takashi; and Nakashima, Kazuto, 4,496,947, Cl. 340-825.240.
Nakata, Tiaki: *See*—
Nagasawa, Takashi; and Nakata, Tiaki, 4,496,685, Cl. 524-708.000.
Nakayama, Takashi; Kajita, Kohji; and Yamagata, Selichi, to Toray Industries, Inc. Multicolored yarn and method. 4,495,761, Cl. 57-328.000.
Nakayama, Toyoo: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Nunomura, Shigeki; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,496,584, Cl. 514-510.000.
Nakazato, Morizo: *See*—
Okada, Fumio; Oba, Toshio; and Nakazato, Morizo, 4,496,687, Cl. 524-859.000.
Nalbandian, Vahakn: *See*—
Wandinger, Lothar; and Nalbandian, Vahakn, 4,496,913, Cl. 331-56.000.
Nalco Chemical Company: *See*—
Albanese, Vincent M., 4,496,525, Cl. 423-242.000.
Namiki, Junji, to NEC Corporation. Interference cancellation type space diversity system. 4,497,067, Cl. 455-273.000.
Nanamura, Kaoru: *See*—
Furuta, Yohichi; Tsubouchi, Kaoru; and Nanamura, Kaoru, 4,495,772, Cl. 60-533.000.
Nanba, Yasuhiro; Gotoh, Takayuki; Yamakawa, Eiji; and Karasaki, Toshihiko, to Minolta Camera Kabushiki Kaisha. Focus detecting photoelectric device and focus detecting system. 4,496,834, Cl. 250-211.00R.
Nannini, Alessandro; and Pagano, Roberto, to Fiat Auto S.p.A. Generator apparatus for the combined production of electrical energy and heat. 4,495,901, Cl. 123-2.000.
Nara, Etuo: *See*—
Masaki, Mikio; Nara, Etuo; Shimizu, Keiichi; and Fukasawa, Takeshi, 4,495,786, Cl. 70-186.000.
Narukawa, Hiroshi: *See*—
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, 4,496,714, Cl. 528-272.000.
Narumi China Corporation: *See*—
Kita, Katsuhiko; Fukuda, Junzo; and Kawahito, Shiro, 4,496,509, Cl. 264-175.000.
National Distillers and Chemical Corporation: *See*—
Blewett, Charles W.; and Sublett, Michael D., 4,496,758, Cl. 560-112.000.
Rekers, Louis J.; and Katzen, Stanley J., 4,496,699, Cl. 526-105.000.
National Federation of Dairy Co-Operative Associations, The: *See*—
Otsubo, Tooichi, 4,496,604, Cl. 426-588.000.
National Research Development Corporation: *See*—
Fisher, Martin J.; Heron, Roger A.; and Hughes, Martin L., 4,495,799, Cl. 73-61.00R.
Hamer, Arthur; and Pardoe, Beverley H., 4,496,884, Cl. 318-114.000.
West, Geoffrey A. W.; and Norton-Wayne, Leonard, 4,496,971, Cl. 358-106.000.
National Semiconductor Corporation: *See*—
Davis, Walter R., 4,497,017, Cl. 363-49.000.
Dunkley, James L.; and Dobkin, Robert C., 4,496,963, Cl. 357-22.000.
Nauman, Delbert A., to AT&T Technologies, Inc. Electrolytic methods for enhancing contrast between metallic surfaces. 4,496,432, Cl. 204-1.00T.
Naumenko, Igor P.: *See*—
Nikolsky, Vladimir A.; Yagodin, Valery M.; Vazhnov, Evgeny N.; Bondar, Efim S.; Naumenko, Igor P.; Vozny, Valery F.; Orlov, Vladimir N.; and Tikhonov, Vladimir I., 4,495,776, Cl. 62-114.000.
Nayate, Pramod D., to Rockwell International Corporation. Method and apparatus for opening folded newspapers. 4,496,141, Cl. 270-55.000.
NCR Corporation: *See*—
McMorrow, Harold L.; and Trzaska, Theodore T., 4,496,256, Cl. 400-248.000.
NEC Corporation: *See*—
Harada, Keiji; and Sato, Akio, 4,496,435, Cl. 204-15.000.
Meintrup, David R.; and Dumpis, Janis, 4,496,255, Cl. 400-208.000.
Namiki, Junji, 4,497,067, Cl. 455-273.000.
Needham, Arthur M.; and Helyer, Laurie E., to Tectron (Eng) Ltd. Fluid injectors. 4,495,967, Cl. 137-614.060.
Needleman, Philip, to Washington University. Atrial Peptides. 4,496,544, Cl. 514-13.000.
Nees; Friedbert: *See*—
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Lucas, Ekhart; Merger, Franz; and Nees, Friedbert, 4,496,770, Cl. 568-463.000.
Neil, Clyde C.: *See*—
Hammer, Jacob M.; and Neil, Clyde C., 4,495,704, Cl. 33-180.00R.
Neisius, Karl-Heinz: *See*—
Eichler, Jurgen; Herz, Claus; Neisius, Karl-Heinz; and Wehner, Gregor, 4,496,447, Cl. 204-159.160.
Nelson, M. Gene. Adjustable book holder including magnifying front panel. 4,496,127, Cl. 248-441.100.
Nelson, Robert E.: *See*—
Nelson, Robert M.; and Nelson, Robert E., 4,496,287, Cl. 417-63.000.
Nelson, Robert M.; and Nelson, Robert E., to Nelson, Robert M. Sensors for detection of fluid condition, and control systems utilizing their signals. 4,496,287, Cl. 417-63.000.
Nelzow, Hartmann; Karlheinz, Farber; and Deininger, Anton, to Bosch-Siemens Hausgerate GmbH. Container, especially a disposable container for beverage concentrates, with a preferably magnetically-actuated reusable measurer attached to the opening of the container. 4,496,078, Cl. 222-87.000.
Nelzow, Hartmann: *See*—
Farber, Karlheinz; and Nelzow, Hartmann, 4,496,080, Cl. 222-129.300.
Nemoto, Seiichiro: *See*—
Sasaki, Kiichi; Kawade, Tateo; and Nemoto, Seiichiro, 4,496,170, Cl. 280-801.000.
Nertman, Inge, to AB Volvo. Blister package with means for securing blister. 4,496,052, Cl. 206-470.000.
Nevitt, Thomas D.: *See*—
Miller, Jeffrey T.; and Nevitt, Thomas D., 4,496,785, Cl. 585-640.000.
Newburg, Betty, executrix: *See*—
Newburg, Norman R., deceased, 4,496,668, Cl. 521-91.000.
Newburg, Norman R., deceased (by Newburg, Betty, executrix), to Hercules Corporated. Cellular thermoset poly(dicyclopentadiene). 4,496,668, Cl. 521-91.000.
Newcomb, Donald R. Trap vertical antenna with parallel L-C circuits for broadbanding. 4,496,952, Cl. 343-722.000.
Newport Corporation: *See*—
Allen, Robert E.; and Thomasson, James T., 4,496,865, Cl. 310-80.000.
Ng, Sun W.: *See*—
Jacks, Shirley L.; and Ng, Sun W., 4,495,861, Cl. 99-422.000.
Nicholson, Myron D., to Union Carbide Corporation. Method for producing smoke colored and smoke flavored encased foodstuff. 4,496,595, Cl. 426-284.000.

Niese, Manfred: *See*—
Skipka, Guido; Alles, Hans-Ulrich; Randau, Gert; and Niese, Manfred, 4,496,764, Cl. 564-418.000.
Niimura, Kouichi: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,561, Cl. 514-209.000.
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,574, Cl. 514-195.000.
Nikkel, Willem A.; and Young, John B., to Westvaco Corporation. Mobile coater. 4,495,890, Cl. 118-674.000.
Nikolsky, Vladimir A.; Yagodin, Valery M.; Vazhnov, Evgeny N.; Bondar, Efim S.; Naumenko, Igor P.; Vozny, Valery F.; Orlov, Vladimir N.; and Tikhonov, Vladimir I., to Vsesojuzny Nauchno-Issledovatelsky Experimentalno Konstruktorsky Institut Elektrobytovyky Machin I Priborov. Method and cooling agent for freezing and storing products. 4,495,776, Cl. 62-114.000.
Nilssen, Ole K. Screw-in fluorescent lamp. 4,496,878, Cl. 315-73.000.
Nilsson, Bengt-Ake: *See*—
Harstrom, Karl U.; Nilsson, Bengt-Ake; and Wheeler, Richard J., 4,495,975, Cl. 141-157.000.
Nimer, Edward L.; and Campbell, Robert W., to Chevron Research Company. Sulfur cement-aggregate compositions and methods for preparing. 4,496,659, Cl. 501-140.000.
Nippe, Burkhard: *See*—
Greiner, Joachim; and Nippe, Burkhard, 4,497,007, Cl. 360-114.000.
Nippon Acchakutanshi Seizo Kabushiki Kaisha: *See*—
Matsui, Minoru; and Saijyo, Yoshihiro, 4,495,682, Cl. 29-33.00M.
Nippon Cable System Inc.: *See*—
Teraura, Makoto, 4,495,881, Cl. 114-159.000.
Nippon Carburetor Co., Ltd.: *See*—
Satoh, Yoichi, 4,496,497, Cl. 261-41.00D.
Nippon Electric Co., Ltd.: *See*—
Takano, Isamu; and Ohta, Norihisa, 4,496,908, Cl. 330-277.000.
Nippon Kogaku K.K.: *See*—
Konno, Kunio; and Okada, Masashi, 4,497,015, Cl. 362-268.000.
Ogasawara, Akira, 4,496,229, Cl. 354-400.000.
Nippon Oil and Fats Co., Ltd.: *See*—
Hirosaki, Yoshikazu; and Hattori, Katsuhide, 4,496,471, Cl. 252-186.210.
Nippon Soken, Inc.: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,496,134, Cl. 251-65.000.
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,497,034, Cl. 364-571.000.
Nippon Thompson Co., Ltd.: *See*—
Geka, Toshiaki, 4,496,198, Cl. 308-6.00C.
Nippon Zeon Co. Ltd.: *See*—
Tsuji, Jiro; and Shimizu, Isao, 4,496,766, Cl. 568-346.000.
Nippondenso Co., Ltd.: *See*—
Ishii, Yoshiya; Hachitani, Shuji; and Tanaka, Yasushi, 4,495,914, Cl. 123-357.000.
Kato, Takaaki; Kato, Takeshi; and Yoshizawa, Yoshikazu, 4,497,037, Cl. 364-900.000.
Kato, Takaaki; Hirano, Yoshio; Ochiai, Takeshi; Ishikawa, Seizi; and Sakai, Kazunori, 4,497,057, Cl. 371-29.000.
Matsumura, Toshimi; Miyaki, Masahiko; Tomishima, Hitoshi; and Masuda, Akira, 4,495,920, Cl. 123-436.000.
Nishida, Mitsuhiro: *See*—
Yamamoto, Sakuei; Nishida, Mitsuhiro; Tashiro, Noboru; and Sonoda, Nobuo, 4,496,866, Cl. 310-87.000.
Nishihara, Motohisa: *See*—
Shimada, Satoshi; Yamada, Kazuji; Suzuki, Seikou; and Nishihara, Motohisa, 4,495,820, Cl. 73-724.000.
Nishiuchi, Kihachiro: *See*—
Morimoto, Takuo; Nishiuchi, Kihachiro; Izumi, Misao; and Ejima, Noriyoshi, 4,496,469, Cl. 252-62.000.
Nissan Motor Company, Limited: *See*—
Hattori, Noboru; and Suzuki, Yoshitomo, 4,495,962, Cl. 137-117.000.
Hiraiwa, Kazuyoshi; and Kawaguchi, Akio, 4,495,832, Cl. 74-475.000.
Kunifumi, Sawamoto, 4,495,921, Cl. 123-438.000.
Nakajima, Yasuo, 4,495,930, Cl. 123-575.000.
Seko, Yasutoshi; Yanagishima, Takayuki; and Inoue, Masami, 4,496,938, Cl. 340-576.000.
Takahashi, Kotei, 4,495,831, Cl. 74-473.00R.
Takase, Sadao; and Hosaka, Akio, 4,495,923, Cl. 123-478.000.
Tanizaki, Hiroyuki; Ebihara, Sakae; Hatanaka, Akimitsu; Ogawa, Takayoshi; and Kanazawa, Yuzo, 4,496,189, Cl. 297-63.000.
Tuchiya, Yoshimasa; Chikaraishi, Takayo; and Kawamo, Kazunori, 4,496,186, Cl. 296-146.000.
Ueno, Takashi; and Takase, Sadao, 4,495,924, Cl. 123-478.000.
Nissan Shatai Company, Limited: *See*—
Tuchiya, Yoshimasa; Chikaraishi, Takayo; and Kawamo, Kazunori, 4,496,186, Cl. 296-146.000.
Nitigus, Victor: *See*—
Apetrei, Constantin; Nitigus, Victor; Elek, Demeter; Radulescu, Marian; and Sachelaire, Toma, 4,496,864, Cl. 310-77.000.
Nitro Nobel A.B.: *See*—
Persson, Per I., 4,496,096, Cl. 228-107.000.
Nitschke, Werner, to Robert Bosch GmbH. Positioning control system. 4,496,885, Cl. 318-122.000.
NL Industries, Inc.: *See*—
House, Roy F.; and Hoover, Lonnie D., 4,496,468, Cl. 252-8.50A.
Wilcox, Roy D., 4,495,800, Cl. 73-61.400.
Noack, Horst-Gunter, to Klockner-Humboldt-Deutz AG. Centrifugal pump. 4,496,281, Cl. 415-111.000.
Noga, Patricia J.: *See*—
Fredrickson, James C.; Noga, Patricia J.; and Strasek, Frank M., 4,495,715, Cl. 36-113.000.
Noguchi, Tadashi: *See*—
Ishida, Kohji; Noguchi, Tadashi; and Numata, Tatsuo, 4,497,063, Cl. 381-7.000.
Noirel, Maurice Y., to L'Etat Francais, Represente par Le Ministre des P.T.A. (Centre National D'Etudes des Telecommunications). One-way data transmission systems. 4,496,975, Cl. 358-147.000.
Nonaka, Chiaki: *See*—
Fujiie, Kazuhiko; and Nonaka, Chiaki, 4,497,047, Cl. 369-45.000.
Nonnenmacher, Gerhard, to Robert Bosch GmbH. Control device for maintaining the product of the lifting pressure and lifting volume times flow constant in an adjustable pump. 4,496,290, Cl. 417-220.000.
Norenburg, Johannes, to Stone & Webster Engineering Corp. Apparatus and method for recovering light hydrocarbons from hydrogen containing gases. 4,496,381, Cl. 62-30.000.
Northland Aluminum Products, Inc.: *See*—
Jorgensen, Jorgen A., 4,496,815, Cl. 219-10.55E.
Northman, Bradley L., to Eaton Corporation. Ultrasonic metering device and housing assembly. 4,496,101, Cl. 239-102.000.
Norton-Wayne, Leonard: *See*—
West, Geoffrey A. W.; and Norton-Wayne, Leonard, 4,496,971, Cl. 358-106.000.
Norwood Industries, Inc.: *See*—
McCartney, John R., 4,496,624, Cl. 428-288.000.
Nowacki, Christopher: *See*—
Brisson, Alfred; and Nowacki, Christopher, 4,495,944, Cl. 128-725.000.
Nowobilski, Jeffert J.; and Owens, William J., to Union Carbide Corporation. High density load bearing insulation peg. 4,496,633, Cl. 428-426.000.
Nozaki, Shigeki: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,496,850, Cl. 307-269.000.
Nozawa, Ryoichiro; and Kawamura, Hideaki, to Fanuc Ltd. Numerical control system. 4,497,028, Cl. 364-474.000.
Nsk-Warner K. K.: *See*—
Ono, Katsuyasu, 4,496,116, Cl. 242-107.40D.
Nulman, Jaime; and Krusius, J. Peter, to Cornell Research Foundation, Inc. Fine line patterning method for submicron devices. 4,496,419, Cl. 156-643.000.
Numata, Koji: *See*—
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,497,034, Cl. 364-571.000.
Numata, Tatsuo: *See*—
Ishida, Kohji; Noguchi, Tadashi; and Numata, Tatsuo, 4,497,063, Cl. 381-7.000.
Nunomura, Shigeki: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Nunomura, Shigeki; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,496,584, Cl. 514-510.000.
Oakes, Harry C. Hole punch apparatus. 4,495,699, Cl. 30-360.000.
Oba, Toshio: *See*—
Okada, Fumio; Oba, Toshio; and Nakazato, Morizo, 4,496,687, Cl. 524-859.000.
Oberle, Edmond; Wattron, Bernard; and Hironimus, Jeannot, to Kuhn S.A. Machine for removing blocks of forage from a silo. 4,496,107, Cl. 241-101.700.
Occidental Research Corporation: *See*—
Finnan, Marshall N., 4,495,987, Cl. 165-70.000.
Ochiai, Takeshi: *See*—
Kato, Takaaki; Hirano, Yoshio; Ochiai, Takeshi; Ishikawa, Seizi; and Sakai, Kazunori, 4,497,057, Cl. 371-29.000.
O'Connor, James M.; and Schnabel, Wilhelm J., to Olin Corporation. Uretdione group-containing polyurethane oligomers and aqueous dispersions thereof. 4,496,684, Cl. 524-591.000.
Odaka, Kentaro: *See*—
Sako, Yoichiro; and Odaka, Kentaro, 4,497,058, Cl. 371-39.000.
Oestreich, Ulrich; and Schubert, Werner, to Siemens Aktiengesellschaft. Optical cable. 4,496,214, Cl. 350-96.230.
Ogasawara, Akira, to Nippon Kogaku K.K. Apparatus for transmitting information signals in a camera. 4,496,229, Cl. 354-400.000.
Ogawa, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Rotary vane pump with overlapping rotor and housing portions. 4,496,297, Cl. 418-133.000.
Ogawa, Takayoshi: *See*—
Tanizaki, Hiroyuki; Ebihara, Sakae; Hatanaka, Akimitsu; Ogawa, Takayoshi; and Kanazawa, Yuzo, 4,496,189, Cl. 297-63.000.
Ogle, Terry B. Apparatus for moving rolled sheet goods. 4,496,179, Cl. 294-26.000.
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, to Sumitomo Chemical Company, Limited. Intermediates to optically active cis-1,3-dibenzyl-hexahydro-1H-furo[3,4-d]imidazole-2,4-dione. 4,496,739, Cl. 548-321.000.
Ohio State University Research Foundation, The: *See*—
Shore, Sheldon G.; and Bhattacharyya, Alakananda, 4,496,532, Cl. 423-417.000.
Ohishi, Kishiro; and Kato, Choji, to Hokuetsu Kamiseisen Kabushikikaisha. Apparatus for and method of removing wound paper from a core rod. 4,496,111, Cl. 242-55.000.

Ohmori, Takashi: *See*—
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,496,988, Cl. 358-294.000.
Ohno, Sachio; Mizukoshi, Kiyoshi; Komatsu, Osamu; Nagasaka, Mitsuaki; and Nakamura, Yoshiki, to Maruko Seiyaku Co., Ltd. Certain pyridyloxy-or-thio-phenyl propenoic acid derivatives. 4,496,735, Cl. 546-301.000.
Ohta, Kenji: *See*—
Deguchi, Toshihisa; Ohta, Kenji; and Takahashi, Akira, 4,497,006, Cl. 360-114.000.
Ohta, Masakatu, to Canon Kabushiki Kaisha. Illuminating apparatus. 4,497,013, Cl. 362-32.000.
Ohta, Norihisa: *See*—
Takano, Isamu; and Ohta, Norihisa, 4,496,908, Cl. 330-277.000.
Ohtsuki, Tadashi, to Sony Corporation. Cue data recording apparatus. 4,496,997, Cl. 360-13.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,496,118, Cl. 242-198.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,497,009, Cl. 360-133.000.
Oiso, Hisayoshi: *See*—
Kuwahara, Rikiya; Habuto, Akinaka; and Oiso, Hisayoshi, 4,496,592, Cl. 426-5.000.
Oka, Akira: *See*—
Zenitani, Hideki; Oka, Akira; Okamoto, Itsuo; Hayashi, Hisao; and Taniguchi, Masajiro, 4,496,057, Cl. 211-26.000.
Okada, Fumio; Oba, Toshio; and Nakazato, Morizo, to Shin-Etsu Chemical Co., Ltd. Aqueous emulsion-type silicone compositions. 4,496,687, Cl. 524-859.000.
Okada, Masashi: *See*—
Konno, Kunio; and Okada, Masashi, 4,497,015, Cl. 362-268.000.
Okado, Terumi: *See*—
Sugiura, Noboru; and Okado, Terumi, 4,495,918, Cl. 123-425.000.
Okajima, Takahiro: *See*—
Takahashi, Hideyuki; Kenmotsu, Isami; and Okajima, Takahiro, 4,497,051, Cl. 369-77.100.
Okamoto, Hiroaki: *See*—
Hamakawa, Yoshihiro; Okamoto, Hiroaki; and Okuda, Kouji, 4,496,788, Cl. 136-249.000.
Okamoto, Itsuo: *See*—
Zenitani, Hideki; Oka, Akira; Okamoto, Itsuo; Hayashi, Hisao; and Taniguchi, Masajiro, 4,496,057, Cl. 211-26.000.
Okamoto, Miyoshi, to Toray Industries, Inc. Fabric composed of bundles of superfine filaments. 4,496,619, Cl. 428-224.000.
Okamoto, Yoshihisa: *See*—
Yang, Wei-Yeih W.; and Okamoto, Yoshihisa, 4,496,514, Cl. 264-328.600.
Okamura Corporation: *See*—
Kaise, Tatsuo, 4,496,278, Cl. 414-735.000.
Okazaki, Toshimasa; Sakata, Akihiro; Nagai, Kyozi; and Nakashima, Kazuo, to Toagosei Chemical Industry Co., Ltd. Process for generating hydrogen gas. 4,496,442, Cl. 204-129.000.
Okigami, Noboru; Hayasaka, Hiroshi; Sekiguchi, Yoshitoshi; and Tamura, Harushige, to Hitachi Shipbuilding & Engineering Co., Ltd. Multi-stage combustion method for inhibiting formation of nitrogen oxides. 4,496,306, Cl. 431-8.000.
Okita, Koichi; and Asako, Shigeru, to Sumitomo Electric Industries, Ltd. Production of string-like polytetrafluoroethylene. 4,496,507, Cl. 264-127.000.
Okuda, Kouji: *See*—
Hamakawa, Yoshihiro; Okamoto, Hiroaki; and Okuda, Kouji, 4,496,788, Cl. 136-249.000.
Okumura, Masumi: *See*—
Yamamoto, Tamio; Kobayashi, Tsukasa; Hirakawa, Tadashi; Yoshida, Makoto; and Okumura, Masumi, 4,496,583, Cl. 428-288.000.
Okutome, Toshiyuki: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Nunomura, Shigeki; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,496,584, Cl. 514-510.000.
Oldham, Keith: *See*—
Yellin, Tobias O.; Gilman, David J.; Edwards, Philip N.; Large, Michael S.; Jones, Derrick F.; and Oldham, Keith, 4,496,571, Cl. 514-340.000.
Olin Corporation: *See*—
Henderson, Richard; Rothgery, Eugene F.; and Schroeder, Hansjuergen A., 4,496,559, Cl. 314-188.000.
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,495,981, Cl. 164-452.000.
Kindlmann, Peter J.; Ungarean, Gary L.; Yarwood, John C.; and Tyler, Derek E., 4,495,983, Cl. 164-452.000.
Kraus, Theodore C., 4,496,529, Cl. 423-365.000.
Lange, Paul H., Jr., 4,496,761, Cl. 564-37.000.
O'Connor, James M.; and Schnabel, Wilhelm J., 4,496,684, Cl. 524-591.000.
Oliver, Kirk D.; and Wolff, David A., to Motorola, Inc. Inductorless pincushion correction circuit. 4,496,882, Cl. 315-371.000.
Olsson, Ingemar; Ottosson, Goran; and Sinner, Bengt, to ASEA Aktiebolag. Method of controlling a web winding process. 4,496,112, Cl. 242-66.000.
Oltarzewski, Edward S.: *See*—
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., 4,496,467, Cl. 252-92.000.
Olympia Werke AG: *See*—
Frerichs, Klaus-Dieter, 4,496,959, Cl. 346-140.00R.
Olympus Optical Co. Ltd.: *See*—
Kimura, Kenji, 4,497,048, Cl. 369-46.000.
Omron Tateisi Electronics Co.: *See*—
Maenishi, Kozo; Adachi, Masaaki; and Bando, Yoshihide, 4,496,806, Cl. 200-16.00R.
Omura, Sadafumi: *See*—
Adachi, Takashi; Morimoto, Shigeo; Takahashi, Yoko; Watanabe, Yoshiaki; and Omura, Sadafumi, 4,496,717, Cl. 536-7.200.
Ong, Helen H.; and Flynn, Matthew J., to Hoechst-Roussel Pharmaceuticals Inc. Analgesic dibenz[b,f]oxepins. 4,496,582, Cl. 514-450.000.
Onga, Makoto: *See*—
Sase, Masatoshi; Onga, Makoto; and Yamanaka, Seisuke, 4,496,967, Cl. 358-44.000.
Ono, Katsuyasu, to Nsk-Warner K. K. Automatic locking retractor. 4,496,116, Cl. 242-107.40D.
Ono, Takashi: *See*—
Yamada, Shunsuke; Kawate, Kenji; Ono, Takashi; Arakawa, Hideo; and Suda, Tsuyoshi, 4,496,312, Cl. 432-11.000.
Ontario Cancer Institute, The: *See*—
Hunt, John W.; and Patterson, Michael S., 4,495,817, Cl. 73-624.000.
Oppenlaender, Knut: *See*—
Greif, Norbert; Oppenlaender, Knut; Hettche, Albert; and Vamvakaris, Christos, 4,496,439, Cl. 204-55.00R.
Optimetrix Corporation: *See*—
Phillips, Edward H., 4,496,194, Cl. 308-5.00R.
Orcutt, John W.; Hightower, Angus W.; and Smith, Reginald W., to Texas Instruments Incorporated. Stacked interdigitated lead frame assembly. 4,496,965, Cl. 357-70.000.
Orentreich, Norman. Topical applications for preventing dry skin. 4,496,556, Cl. 514-178.000.
Orlov, Vladimir N.: *See*—
Nikolsky, Vladimir A.; Yagodin, Valery M.; Vazhnov, Evgeny N.; Bondar, Efim S.; Naumenko, Igor P.; Vozny, Valery F.; Orlov, Vladimir N.; and Tikhonov, Vladimir I., 4,495,776, Cl. 62-114.000.
Oronsky, Arnold L., to American Cyanamid Company. Treatment of malaria with antibiotics. 4,496,549, Cl. 514-27.000.
Ortner, Georg J. Container with information-carrying element. 4,496,051, Cl. 206-459.000.
Osaka Transformer Co., Ltd.: *See*—
Hamakawa, Yoshihiro; Okamoto, Hiroaki; and Okuda, Kouji, 4,496,788, Cl. 136-249.000.
Osburn, Frank G., to Hollister Incorporated. Skin barrier composition. 4,496,357, Cl. 604-336.000.
Osrow, Leonard. Hand-held shock-resistant electrolytically heated steam producing apparatus. 4,496,826, Cl. 219-272.000.
O'Sullivan Corporation: *See*—
Dawson, C. Bruce, 4,496,113, Cl. 242-67.10R.
Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH & Co. KG: *See*—
Borner, Roland; Holstein, Herbert; and Sennewald, Jurgen, 4,495,733, Cl. 51-165.00R.
Ota, Isao, to Matsushita Electric Industrial Co., Ltd. Video camera with a monitor. 4,496,981, Cl. 358-213.000.
Ota, Tomio; Miyasaka, Mamoru; and Hiraga, Imao, to Kabushiki Kaisha Suwa Seikosha. Timepiece construction. 4,496,246, Cl. 368-88.000.
Otsubo, Tooichi, to National Federation of Dairy Co-Operative Associations, The. Powdery instant milk composition and method of producing the same. 4,496,604, Cl. 426-588.000.
Otsubo, Yorihumi: *See*—
Yoshihara, Setsuo; Otsubo, Yorihumi; and Kobayashi, Takashi, 4,496,830, Cl. 235-458.000.
Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Morimoto, Takuo; Nishiuchi, Kihachiro; Izumi, Misao; and Ejima, Noriyoshi, 4,496,469, Cl. 252-62.000.
Ottoson, Javan D., to Atlantic Richfield Company. Method for stabilizing particulate low rank coal in a fluidized bed. 4,495,710, Cl. 34-10.000.
Ottosson, Goran: *See*—
Olsson, Ingemar; Ottosson, Goran; and Sinner, Bengt, 4,496,112, Cl. 242-66.000.
Ovchinnikov, Igor E.: *See*—
Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., 4,496,868, Cl. 310-112.000.
Overland, Christian; and Gaarde, Knud-Werner. Hollow surgical disposable needle, preferably of the Redon type. 4,496,353, Cl. 604-272.000.
Owens-Corning Fiberglas Corporation: *See*—
Lin, David C. K., 4,496,384, Cl. 65-4.400.
Lin, David C. K., 4,496,385, Cl. 65-9.000.
Owens-Illinois, Inc.: *See*—
Kontz, Robert F., 4,496,409, Cl. 156-85.000.
Owens, Walter K., to Mfg. Design, Inc. Newspaper vending machine. 4,496,074, Cl. 221-39.000.
Owens, William J.: *See*—
Nowobilski, Jeffert J.; and Owens, William J., 4,496,633, Cl. 428-426.000.
Owens, William M.: *See*—
Ferguson, Douglas M.; Owens, William M.; Lang, Michael; and Lincoln, Jay P., 4,496,045, Cl. 206-63.300.
Oy Fiskars AB: *See*—
Fethke, Wayne G.; and Call, Daniel D., 4,495,696, Cl. 30-138.000.

Oy Nokia Ab: *See*—
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Salminen, Kari; and Soderholm, Nils, 4,496,429, Cl. 162-358.000.

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Fujimura, Akira; and Ozaki, Shunzaburo, 4,495,922, Cl. 123-440.000.

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Boogers, Wilhelmus P. L., 4,495,955, Cl. 131-105.000.

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Larsen, Richard R., 4,496,097, Cl. 228-212.000.

Package Machinery Company: *See*—
Crescenzo, Francis C.; and LaFleur, Paul J., Jr., 4,495,745, Cl. 53-77.000.

PACOR: *See*—
Maffrand, Jean-Pierre; and Frehel, Daniel, 4,496,568, Cl. 514-301.000.

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Ciabatti, Romeo; and Padova, Giovanna, 4,496,743, Cl. 548-533.000.

Pagano, Roberto: *See*—
Nannini, Alessandro; and Pagano, Roberto, 4,495,901, Cl. 123-2.000.

Palanuik, Elko: *See*—
Kirkland, Edmund R.; Palanuik, Elko; and Ingman, Harlan V., 4,495,724, Cl. 47-57.600.

Pall Corporation: *See*—
Christel, Conrad, Jr., 4,496,940, Cl. 340-640.000.

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Conrad, Frederick L.; Palmer, Louis R.; and Roberts, Arthur A., 4,496,245, Cl. 366-143.000.

Palumbo, Pasquale M. Dynamic ankle brace. 4,495,942, Cl. 128-80.00H.

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Hall, John M.; and Pantic, Milan, 4,496,033, Cl. 188-347.000.

Papst-Motoren GmbH & Co. KG: *See*—
von der Heide, Johann; and Schuh, Bernhard, 4,497,002, Cl. 360-97.000.

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Pardoe, Beverley H.: *See*—
Hamer, Arthur; and Pardoe, Beverley H., 4,496,884, Cl. 318-114.000.

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Duchadeau, Pierre, 4,496,086, Cl. 222-412.000.

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King, Peter F., 4,496,404, Cl. 148-6.14R.
Murphy, Donald P., 4,496,374, Cl. 55-84.000.

Parker, John A.: *See*—
Varma, Indra K.; Fohlen, George M.; and Parker, John A., 4,496,701, Cl. 526-262.000.

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Jackson, Brian L.; and Parker, Philip, 4,495,844, Cl. 83-715.000.

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Parkins, William E. Power generation from wind. 4,496,847, Cl. 290-44.000.

Parliment, Thomas H., to General Foods Corporation. Flavoring with 2-mercaptoalkyl oxathiolanes and oxathianes. 4,496,600, Cl. 426-535.000.

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Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,496,390, Cl. 71-92.000.

Paschen, Rolf: *See*—
Brandt, Joachim; Deblitz, Gerhard; Post, Jurgen; Willimczik, Bernd; Marten, Rolf; Paschen, Rolf; and Anderka, Gerold, 4,496,958, Cl. 346-139.00R.

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Pate, Harold T.; Laney, William R.; and Shell, Donald H., to Thyssen-Bornemisza Inc. Large diameter plastic pipe. 4,495,970, Cl. 138-148.000.

Paton, William D.: *See*—
Steenson, Thomas W.; and Paton, William D., 4,496,504, Cl. 264-69.000.

Patterson, Michael S.: *See*—
Hunt, John W.; and Patterson, Michael S., 4,495,817, Cl. 73-624.000.

Paul, Marsha A.: *See*—
Doorakian, George A.; Paul, Marsha A.; and Gist, Adolphus V., 4,496,709, Cl. 528-89.000.

Paulinski, Ronald A., to Burroughs Corporation. Circuit board test fixture. 4,496,903, Cl. 324-158.00F.

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Hafez, Mahmoud M.; and Pauls, Henry W., 4,496,456, Cl. 208-33.000.

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Lowery, Jack R., Sr.; and Payet, George L., 4,496,407, Cl. 156-73.300.

Paz, Mercedes: *See*—
Gallop, Paul M.; and Paz, Mercedes, 4,496,722, Cl. 544-69.000.

PCUK Produits Chimiques Ugine Kuhlmann: *See*—
Devic, Michel, 4,496,760, Cl. 562-460.000.

Peacock, Donald G.: *See*—
Davis, Frederick J.; and Peacock, Donald G., 4,496,410, Cl. 156-84.000.

Peemoller, Horst: *See*—
Beckmann, Friedrich K.; Helzel, Thomas; and Peemoller, Horst, 4,496,202, Cl. 339-5.00R.

Peerman, Dwight E.; and Rogier, Edgar R., to Henkel Corporation. Hydroxymethyl polyols. 4,496,487, Cl. 260-404.000.

Penso, Luigi: *See*—
Bettini, Giuliano; Penso, Luigi; and Rodriguez, Giuseppe, 4,496,949, Cl. 343-7.700.

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Mistretta, Charles A.; Peppler, Walter W.; Kudva, Balakrishna V.; Hasegawa, Bruce H.; and Dobbins, James T., III, 4,497,062, Cl. 378-158.000.

Pera, Eugene R., to Peratron Corporation. Programmable electronic display. 4,496,946, Cl. 340-796.000.

Peratron Corporation: *See*—
Pera, Eugene R., 4,496,946, Cl. 340-796.000.

Perkins, Kelly M.: *See*—
Zsolnay, Andrew; Perkins, Kelly M.; and Blad, Leiv H., 4,496,697, Cl. 526-60.000.

Perlstein, Jerome H.: *See*—
Chen, Chin H.; Goliber, Thomas E.; Perlstein, Jerome H.; and Reynolds, George A., 4,496,730, Cl. 546-23.000.

Pernicano, Vincent S. Heat transfer sheeting having release agent coat. 4,496,618, Cl. 428-201.000.

Perron, Alain: *See*—
Proux, Yves; and Perron, Alain, 4,496,691, Cl. 525-73.000.

Persson, Per I., to Nitro Nobel A.B. Method of joining metal elements by explosion welding. 4,496,096, Cl. 228-107.000.

Perun, William D.; and Garavuso, Gerald M., to Xerox Corporation. Paddle wheel feeder with normal force optimization and blade control. 4,496,144, Cl. 271-114.000.

Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Company, The. Upgrading synthesis gas. 4,496,666, Cl. 518-706.000.

Peters, Susan M., to Clorox Company, The. Configured fuel briquet and method. 4,496,366, Cl. 44-14.000.

Petersen, Tom K., to Danfoss A/S. Arrangement for controllably driving an A.C. motor. 4,496,894, Cl. 318-759.000.

Peterson, Theodore A. Instant sawhorse. 4,496,028, Cl. 182-186.000.

Petrocarbon Developments Limited: *See*—
Hubbard, Colin; Limb, David I.; and Duckett, Melvyn, 4,496,383, Cl. 62-31.000.

Pettersson, Ola, to KB Cold Isostatic Press Systems CIPS. Unit containing a moulding tool for semi-isostatic compaction of a powder contained in the press tool cavity. 4,496,299, Cl. 425-405.00H.

Pews, R. Garth: *See*—
Clouse, Robert C.; and Pews, R. Garth, 4,496,773, Cl. 568-730.000.

Peyronel, Jean-Francois: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,496,560, Cl. 514-204.000.

Pfaff Industriemaschinen GmbH: *See*—
Willenbacher, Erich, 4,495,877, Cl. 112-121.110.

Pfahler, Gerhard: *See*—
Wiezer, Hartmut; and Pfahler, Gerhard, 4,496,726, Cl. 544-198.000.

Pfizer Inc.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Watts, Paul C.; Shibakawa, Riichiro; and Tone, Junsuke, 4,496,546, Cl. 514-29.000.
Cross, Peter E.; and Dickinson, Roger P., 4,496,572, Cl. 514-337.000.

Pfleiderer, Hans-Joerg; and Herbst, Heiner, to Siemens Aktiengesellschaft. Two-dimensional semiconductor image sensor with regulated integration time. 4,496,980, Cl. 358-212.000.

Pharmacia AB: *See*—
Harstrom, Karl U.; Nilsson, Bengt-Ake; and Wheeler, Richard J., 4,495,975, Cl. 141-157.000.

Phase Change Technology, Inc.: *See*—
Wasserman, Kurt J., 4,495,723, Cl. 47-2.000.

Phelps, Richard W., to Black Clawson Company, The. Precision roll coater. 4,495,886, Cl. 118-249.000.

Phillips, Edward H., to Optimetrix Corporation. Gas bearing. 4,496,194, Cl. 308-5.00R.

Phillips Petroleum Company: *See*—
Billings, William G., 4,496,370, Cl. 48-197.00R.
Chen, Hsiu Kuo; and Thomas, Charles P., 4,495,995, Cl. 166-273.000.
Mozer, Larry P.; and Morgan, Bill T., 4,496,301, Cl. 425-532.000.

Phillips, Robert F.: *See*—
McIntyre, James A.; and Phillips, Robert F., 4,496,437, Cl. 204-24.000.
Pigneul, Raymond, to Beghin-Say S.A. Sanitary articles to absorb body liquids. 4,496,359, Cl. 604-387.000.
Pijaszek, Robert F.: *See*—
Kusmierz, Marvin A.; and Pijaszek, Robert F., 4,496,828, Cl. 219-405.000.
Pilot Ink Co., Ltd.: *See*—
Tanaka, Isao; and Inaba, Takao, 4,496,258, Cl. 401-206.000.
Pioneer Electronic Corporation: *See*—
Ishida, Kohji; Noguchi, Tadashi; and Numata, Tatsuo, 4,497,063, Cl. 381-7.000.
Takahashi, Hideyuki; Kenmotsu, Isami; and Okajima, Takahiro, 4,497,051, Cl. 369-77.100.
Tokumo, Akio, 4,496,860, Cl. 307-542.000.
Pioneer Plastics, Inc.: *See*—
Blease, Wilfred J., 4,496,068, Cl. 220-4.00D.
Piotroski, Peter N.: *See*—
Gomes, John M.; and Piotroski, Peter N., 4,497,040, Cl. 364-900.000.
Pipes, George R., to Eaton Corporation. Material handling vehicle. 4,496,274, Cl. 414-340.000.
Pissot, Guy, to Thomson-Brandt. Latch for the closure panel of a unit such as a cassette reader and a unit fitted with said latch. 4,496,177, Cl. 292-87.000.
Pitchford, Edward J., to Rain Bird Sprinkler Mfg. Corp. Reaction drive sprinkler. 4,496,103, Cl. 239-230.000.
Pitney Bowes Inc.: *See*—
Gomes, John M.; and Piotroski, Peter N., 4,497,040, Cl. 364-900.000.
Pitschi, Franz X.: *See*—
Spinner, Georg; and Pitschi, Franz X., 4,496,208, Cl. 339-177.00R.
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicides containing 3-aryl-5-methylpyrazole-4-carboxylic acid esters, their manufacture and use. 4,496,391, Cl. 71-92.000.
Plau, Bernard: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,496,560, Cl. 514-204.000.
Pless, Janos: *See*—
Bauer, Wilfried; and Pless, Janos, 4,496,543, Cl. 514-11.000.
Plotkin, George M.; Bendrick, Charles J.; and Wolf, George, to Massachusetts Institute of Technology. Method for treating cancer using galactose-specific lectins. 4,496,539, Cl. 424-94.000.
Plus One Ltd.: *See*—
Coley, Charles R.; and Hall, J. Roger, 4,495,678, Cl. 24-113.00R.
Pluss, Raymond, to Sulzer Brothers Limited. Statistical packing. 4,496,498, Cl. 261-95.000.
Pohorski, Daniel W., to James Dole Corporation. Hot air aseptic packaging system and method. 4,495,974, Cl. 141-132.000.
Poignant, Jean-Claude: *See*—
Malen, Charles; and Poignant, Jean-Claude, 4,496,557, Cl. 514-211.000.
Polaroid Corporation: *See*—
Baker, James G., 4,496,223, Cl. 350-432.000.
Carrera, Jacinto P., 4,496,921, Cl. 335-258.000.
Cerankowski, Leon D.; LaPointe, Gary S.; and Mattucci, Neil C., 4,496,651, Cl. 430-490.000.
Cowan, James J., 4,496,216, Cl. 350-162.170.
Politechnika Warszawska: *See*—
Krecisz, Maria; Kotlewski, Witold; and Bebenkowski, Krzysztof, 4,496,930, Cl. 338-26.000.
Polk Audio, Inc.: *See*—
Polk, Matthew S., 4,497,064, Cl. 381-24.000.
Polk, Matthew S., to Polk Audio, Inc. Method and apparatus for reproducing sound having an expanded acoustic image. 4,497,064, Cl. 381-24.000.
Pommer, Ernst-Heinrich: *See*—
Acker, Rolf-Dieter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,496,563, Cl. 514-222.000.
Stubenrauch, Gerd; Ammermann, Eberhard; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,496,738, Cl. 548-262.000.
Pontecorvo, John J. Trailer construction. 4,496,187, Cl. 296-182.000.
Popelish, John A.: *See*—
Lahut, Joseph A.; and Popelish, John A., 4,496,962, Cl. 346-74.500.
Porous Materials, Inc.: *See*—
Gupta, Krishna M., 4,495,795, Cl. 73-38.000.
Porta Systems Corp.: *See*—
Hung, Peter, 4,496,804, Cl. 200-11.00A.
Portable Terminal Corp.: *See*—
Greenblatt, Richard W., 4,496,943, Cl. 340-711.000.
Porter, James A., Jr.; Shivers, Joe D.; Rozycki, Marek; and Johnston, Otis, to Litton Resources Systems, Inc. Interchangeable drive means for a vehicle. 4,496,015, Cl. 180-9.260.
Post, Jurgen: *See*—
Brandt, Joachim; Deblitz, Gerhard; Post, Jurgen; Willimczik, Bernd; Marten, Rolf; Paschen, Rolf; and Anderka, Gerold, 4,496,958, Cl. 346-139.00R.
Potter, James S.: *See*—
Carley, Joseph L.; Potter, James S.; and Ciccotelli, Anthony A., 4,496,812, Cl. 200-159.00B.
Potters Industries, Inc.: *See*—
Abrams, John C., 4,496,475, Cl. 252-514.000.
Pottier, Alain; and Chesnel, Pierre, to Schlumberger Technology Corporation. Well perforating apparatus. 4,496,008, Cl. 175-4.600.
Powell, Justin C., to Texaco Inc. Synthesis of alkenyl saturated aliphatic polycarboxylic acid anhydrides. 4,496,746, Cl. 549-255.000.
PPG Industries, Inc.: *See*—
Heithoff, Robert B.; Groetzinger, John K.; and Schwenninger, Ronald L., 4,496,387, Cl. 65-335.000.
Savolskis, Edward P., 4,496,315, Cl. 432-30.000.
Sherby, James E., 4,495,845, Cl. 83-886.000.
Tsai, Yih-Wan, 4,496,316, Cl. 432-30.000.
Precision Timer Co., Inc.: *See*—
Bentz, Joseph W., 4,496,305, Cl. 431-1.000.
Prescher, Gunther: *See*—
Bergstein, Wolfgang; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,496,729, Cl. 544-336.000.
Price, John W., to AT&T Technologies, Inc. Circuit for automatically connecting and disconnecting a speakerphone to a telephone line. 4,496,797, Cl. 179-81.00B.
Priepke, Edward H.: *See*—
Greiner, James G.; and Priepke, Edward H., 4,495,756, Cl. 56-364.000.
Primages, Inc.: *See*—
Lau, Edward H.; and Colonel, Kenneth, 4,496,254, Cl. 400-175.000.
Pringle, Ronald E., to Camco, Incorporated. Tubing pressure balanced well safety valve. 4,495,998, Cl. 166-321.000.
Pritzkow, Dennis H.; and Vavrek, Robert M., to General Electric Company. Radiation detector with resonant frequency translator. 4,496,841, Cl. 250-374.000.
Process Technologies, Inc.: *See*—
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,497,033, Cl. 364-551.000.
Procter & Gamble Company, The: *See*—
Joffe, Frederick M.; and Dysart, John K., 4,496,360, Cl. 604-397.000.
Mihelich, Edward D., 4,496,759, Cl. 562-503.000.
Moret, David M.; and Ahr, Nicholas A., 4,495,658, Cl. 2-49.00R.
Proctor-Silex, Inc.: *See*—
Sturdevant, Eugene J., 4,496,827, Cl. 219-399.000.
Prohs, John R. System for interrelating sound transducers or sound sources and their environment. 4,496,022, Cl. 181-175.000.
Prosl, Frank R.; and Sampson, Edward J., to Infusaid Corporation. Infusate pump. 4,496,343, Cl. 604-86.000.
Proux, Yves; and Perron, Alain, to Societe Francaise d'Organo-Synthese. Additives for lubricating oils containing styrene and heavy C_{12}–C_{20} alkyl esters of methacrylic acid, preparation method and applications. 4,496,691, Cl. 525-73.000.
Ptasienski, Mitchell P.; Mustoe, Robert M.; and Zajonc, Fred H., deceased (by Zajonc, Margaret S., executrix), to United States Gypsum Company. Method for cutting gypsum board with high velocity fluid cutting jet. 4,496,515, Cl. 264-504.000.
Pugsley, Peter C., to Crosfield Electronics Limited. Reproduction of colored images. 4,496,968, Cl. 358-80.000.
Pyde, Edwin: *See*—
Stone, Albert; Pyde, Edwin; and Carveth, Peter, 4,496,046, Cl. 206-219.000.
Quarroz, Daniel, to Lonza Ltd. Procedure for producing 2-aminopyridines from 2-pyridine carboxylic acid-N-oxides. 4,496,733, Cl. 546-310.000.
Quellais, Jacques: *See*—
Salomon, Georges P. J.; and Quellais, Jacques, 4,496,169, Cl. 280-615.000.
Quick, Terrence R.; Miranti, Joseph P., Jr.; and Foster, Randy C., to Dayco Corporation. Pulley construction and method of making the same. 4,496,335, Cl. 474-15.000.
Quidel: *See*—
Katz, David H.; Cooper, Steven W.; Lee, Theodore T.; and Chang, Shung-Ho, 4,496,654, Cl. 435-7.000.
Quittkat, Wolfram; Reuter, Gerhard; and Schmidt, Rudiger, to BKMI Industrieanlagen GmbH. Method of calcining minerals containing heat-value components. 4,496,313, Cl. 432-14.000.
R. J. Reynolds Tobacco Company: *See*—
Hester, Benny L.; and Fleming, William F., III, 4,495,796, Cl. 73-38.000.
Raasch, Hans; Grecksch, Hans; and Bock, Klaus, to W. Schlafhorst & Co. Double-sided textile machine. 4,496,110, Cl. 242-35.50A.
Rab Tec Products Corp.: *See*—
Hwang, Chong S.; and Lampert, Barry, 4,496,320, Cl. 433-60.000.
Radd, Fred J.: *See*—
Scott, James B.; and Radd, Fred J., 4,495,997, Cl. 166-285.000.
Radulescu, Marian: *See*—
Apetrei, Constantin; Nitigus, Victor; Elek, Demeter; Radulescu, Marian; and Sachelaire, Toma, 4,496,864, Cl. 310-77.000.
Rain Bird Sprinkler Mfg. Corp.: *See*—
Pitchford, Edward J., 4,496,103, Cl. 239-230.000.
Ramesohl, Hubert: *See*—
Steinbiss, Eberhard; Herchenbach, Horst; Ramesohl, Hubert; and Wolter, Albrecht, 4,496,396, Cl. 106-100.000.
Randau, Gert: *See*—
Skipka, Guido; Alles, Hans-Ulrich; Randau, Gert; and Niese, Manfred, 4,496,764, Cl. 564-418.000.
Ransom, Stephen A.; and Stickel, Tedd K., to Sperry Corporation. GaAs to ECL level converter. 4,496,856, Cl. 307-475.000.
Raquet, Erwin: *See*—
Kasper, Willi; Licht, Helmut; Raquet, Erwin; and Schneider, Jurgen, 4,496,183, Cl. 295-7.000.
Rasmussen, James R.; and Virkar, Anil V., to Ceramatec, Inc. Hydrogen selenide treatment of electrolytes. 4,496,639, Cl. 429-193.000.

Rathvon, Kathryn P.; and Rathvon, William P. Cast moving device. 4,495,941, Cl. 128-80.00G.
Rathvon, William P.: *See*—
Rathvon, Kathryn P.; and Rathvon, William P., 4,495,941, Cl. 128-80.00G.
Rauch, Hans, to Claas Saulgau GmbH. Grinding arrangement for chopping cutter of drum-chopper machine. 4,495,734, Cl. 51-249.000.
Raue, Roderich, to Bayer Aktiengesellschaft. 3H-Indol-2-yl cationic hydrazone dyestuffs. 4,496,719, Cl. 548-455.000.
Ray, Frank L. Rotary metering and dispensing apparatus. 4,496,075, Cl. 221-235.000.
Raychem Corporation: *See*—
Allen, Leslie J., 4,496,094, Cl. 228-56.000.
Raychem Limited: *See*—
Davis, Frederick J.; and Peacock, Donald G., 4,496,410, Cl. 156-84.000.
McLoughlin, Robert H.; and Kirkham, Stanley W., 4,496,616, Cl. 428-36.000.
Raymond Corporation, The: *See*—
Allen, Ralph E.; and Gibson, Christian D., 4,496,031, Cl. 187-9.00R.
Raynes, Edward P.: *See*—
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RCA Corporation: *See*—
Altman, Ted N., 4,496,219, Cl. 350-332.000.
Ham, William E., 4,496,418, Cl. 156-643.000.
Hammer, Jacob M.; and Neil, Clyde C., 4,495,704, Cl. 33-180.00R.
Levine, Peter A., 4,496,982, Cl. 358-221.000.
Read, Edgar L., to Honeywell Inc. One-for-N redundancy in a digital switch matrix. 4,497,054, Cl. 370-58.000.
Realex Corporation: *See*—
Ford, John M. B.; and Foster, Donald D., 4,496,085, Cl. 222-321.000.
Reck, Richard A., to Akzona Incorporated. Asphalt emulsions comprising N-aliphatic-1,3-diaminopentane emulsifier and process. 4,496,474, Cl. 252-311.500.
Redeker, Detmar; and Mrotzek, Dieter, to Bayer Aktiengesellschaft. Screw centrifuge with a washing device. 4,496,340, Cl. 494-29.000.
Reed Rock Bit Company: *See*—
Freitag, Gary T.; and Smith, Roger C., 4,495,840, Cl. 81-54.000.
Reeder, Donald G. Livestock feeder. 4,495,895, Cl. 119-52.0AF.
Reffert, Rudi W.: *See*—
Hambrecht, Juergen; Reffert, Rudi W.; Echte, Adolf; and Swoboda, Johann, 4,496,679, Cl. 524-111.000.
Reges, Bruno. Process for drying and/or preserving fruits having a high sugar content. 4,496,597, Cl. 426-402.000.
Regie Nationale Des Usines Renault: *See*—
Hannoyer, Gilles, 4,497,025, Cl. 364-424.000.
Rehackova, Bozena: *See*—
Junek, Jan; Vorbornik, Vaclay; Ripka, Josef; Jaros, Frantisek; Lihtarova , Ludmila; Hortlik, Frantisek; Kotrba, Zdenek; Rehackova, Bozena; and Dvorak, Ladislav, 4,495,762, Cl. 57-411.000.
Rehberger, James M.: *See*—
Froehling, Paul H.; Anders, Jude R.; Strojny, Lawrence J.; and Rehberger, James M., 4,497,031, Cl. 364-505.000.
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Cosentino, Louis C., 4,496,349, Cl. 604-175.000.
Cosentino, Louis C., 4,496,350, Cl. 604-175.000.
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Stadjuhar, Robert C.; and Renfro, Cecil S., 4,496,945, Cl. 340-764.000.
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Renshaw, Theodore A.; and Sarrantonio, Albert, to Fairchild Industries, Inc. Progressive ultrasonic welding system. 4,496,095, Cl. 228-102.000.
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Research Products/Blankenship Corporation: *See*—
Blankenship, Ernest B., 4,495,873, Cl. 110-250.000.
Resnick, Paul R.: *See*—
Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,496,750, Cl. 549-455.000.
Resource Ventures, Inc.: *See*—
Harp, James J., 4,496,275, Cl. 414-420.000.
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Clatworthy, Stuart C., 4,496,941, Cl. 340-644.000.
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Chen, Chin H.; Goliber, Thomas E.; Perlstein, Jerome H.; and Reynolds, George A., 4,496,730, Cl. 546-23.000.
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Cassell, Ernest W., Jr.; and Gilliam, Edward C., 4,495,797, Cl. 73-40.000.
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Rheinmetall GmbH: *See*—
Bisping, Bernhard, 4,495,869, Cl. 102-503.000.
Winkler, Gert; Becker, Wilfried; and Zielinski, Erich, 4,495,852, Cl. 89-46.000.
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Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,496,560, Cl. 514-204.000.
Rice, Benjamin M., to Candela Corporation. Series inverter for capacitor charging. 4,497,018, Cl. 363-96.000.
Richardson, Robert, to Marconi Company Limited, The. Pulse transformer having conductive shield around magnetic core material. 4,496,924, Cl. 336-84.00R.
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Beggs, George; and Richardson, Thomas H., 4,495,957, Cl. 132-92.00A.
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Dowling, Donald J.; Richter, Albert P., Jr.; Warren, Wayne F.; and Arnold, Dan M., 4,495,805, Cl. 73-155.000.
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Yuasa, Kazuhiro; Takahashi, Shuichi; and Kondo, Mitsuru, 4,496,987, Cl. 358-283.000.
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Jensen, Gerald A.; Wesbey, William H.; and Riederer, Stephen J., 4,496,985, Cl. 358-111.000.
Rieger, Franz: *See*—
Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,496,455, Cl. 204-412.000.
Riemer, Heinz: *See*—
Gude, Fritz; Haferkorn, Herbert; Riemer, Heinz; and Dormann, Gunter, 4,496,710, Cl. 528-114.000.
Riew, Changkiu K.; and Howard, Frank H., to B. F. Goodrich Company, The. Molding compositions of polyvinyl chloride and polymerizable plasticizers. 4,496,692, Cl. 525-112.000.
Rijckaert, Josephus F.: *See*—
Sanders, Rudolf; and Rijckaert, Josephus F., 4,496,874, Cl. 313-318.000.
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McQuinn, Roy L.; Bronn, William R.; and Banitt, Elden H., 4,496,734, Cl. 546-221.000.
Riley, Thomas J. Polymeric film coating apparatus. 4,495,889, Cl. 118-666.000.
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Diepold-Scharnitzky, Rudolf; Lesche, Wolfgang; and Rindfleisch, Volker, 4,497,038, Cl. 364-900.000.
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Rise, William E., to Android Corporation. Humper conveyor. 4,496,042, Cl. 198-774.000.
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Ritter, Christoph: *See*—
Marsoner, Hermann; and Ritter, Christoph, 4,496,512, Cl. 264-267.000.
Ritter, Gerhard; Ritter, Klaus; and Jahrbacher, Gerhard, to Evg Entwicklungs- und Verwertungs-Gesellschaft m.b.H. Multispot electrical resistance welding machine. 4,496,820, Cl. 219-87.000.
Ritter, James D., to Boeing Company, The. Multiple lap-joint for thermoplastic laminates and method of making the lap-joint. 4,496,412, Cl. 156-157.000.
Ritter, Klaus: *See*—
Ritter, Gerhard; Ritter, Klaus; and Jahrbacher, Gerhard, 4,496,820, Cl. 219-87.000.
Ritter, Thomas A.; Kaganov, Alan L.; and Budris, John P., to American Cyanamid Company. Modification of polyglycolic acid structural elements to achieve variable in-vivo physical properties. 4,496,446, Cl. 204-159.140.
Rivera, Paolo: *See*—
Boella, Marcello; and Rivera, Paolo, 4,496,835, Cl. 250-231.0SE.
Robert Bosch GmbH: *See*—
Braschel, Volker; Emig, Reiner; Leiber, Heinz; Mendel, Michael; and Gerstenmeier, Jurgen, 4,497,026, Cl. 364-426.000.
Grauel, Ingolf; Hofer, Gerald; Kulke, Gunter; and Stumpe, Werner, 4,496,192, Cl. 303-13.000.
Hausdorfer, Michael; and Hess, Heinz, 4,496,966, Cl. 358-22.000.

Heinz, Richard, 4,497,005, Cl. 360-109.000.
Heiser, Joachim; and Wilke, Gerhard, 4,496,289, Cl. 417-217.000.
Heitmann, Jurgen, 4,496,974, Cl. 358-140.000.
Krauter, Immanuel; and Schweizer, Hartmut, 4,495,931, Cl. 123-651.000.
Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,496,455, Cl. 204-412.000.
Nitschke, Werner, 4,496,885, Cl. 318-122.000.
Nonnenmacher, Gerhard, 4,496,290, Cl. 417-220.000.
Ruhle, Walter, 4,495,825, Cl. 74-7.00E.

Roberts, Arthur A.: *See—*
Conrad, Frederick L.; Palmer, Louis R.; and Roberts, Arthur A., 4,496,245, Cl. 366-143.000.

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Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,496,390, Cl. 71-92.000.

Roberts, Thomas P.; Howard, Albert R.; and Hutchison, James B., to Western Progress, Inc. Splicing module test set. 4,496,801, Cl. 179-175.30R.

Robinet, Jules P.: *See—*
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,496,792, Cl. 174-65.00R.

Rocca, Jorge J.; and Collins, George J., to Colromm, Inc. Electron beam etching of integrated circuit structures. 4,496,449, Cl. 204-192.00E.

Roche, Joseph R.; Morrill, Charles D.; and Hynes, Joseph H., to Hydril Company. Threaded coupling. 4,496,173, Cl. 285-24.000.

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Cleveland, Donald C., 4,496,333, Cl. 464-162.000.
Nayate, Pramod D., 4,496,141, Cl. 270-55.000.
Shaheen, Joseph M.; and Yancey, Herbert W., 4,496,215, Cl. 350-96.230.
Spinks, Raleigh J., Jr.; Edwards, Richard C.; and Dahm, Joseph J., 4,496,953, Cl. 343-792.000.
Swanson, Ronald L.; and Strathman, Lyle R., 4,496,976, Cl. 358-147.000.
Yamamura, Michael M., 4,496,855, Cl. 307-350.000.

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Erickson, Donald P., 4,495,858, Cl. 98-38.100.

Rodenberger, Frank A.: *See—*
Davies, Richard A.; Lee, Michael W.; Rodenberger, Frank A.; Hill, James R.; Kulavich, David P.; and Sowell, Donald L., 4,496,411, Cl. 156-136.000.

Rodriguez, Giuseppe: *See—*
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Rody, Jean: *See—*
Leppard, David G.; and Rody, Jean, 4,496,649, Cl. 430-372.000.

Roeder, Malcholm O. Medication dispenser. 4,495,958, Cl. 132-113.000.

Rogers Corporation: *See—*
Gottlieb, Michael M.; Fishman, David S.; and Buysse, Henri, 4,497,012, Cl. 361-306.000.

Rogers, Morris A.: *See—*
Rispoli, Joseph M.; Rogers, Morris A.; Sergenian, Haig H.; Swartley, John S.; and Topalian, Harry, 4,496,601, Cl. 426-554.000.

Rogier, Edgar R.: *See—*
Peerman, Dwight E.; and Rogier, Edgar R., 4,496,487, Cl. 260-404.000.

Rogier, Leonce, to Valeo. Wheel hub assembly with integrated reduction gear and brake mechanism. 4,496,017, Cl. 180-70.100.

Rohr, Martin: *See—*
Naegeli, Peter; and Rohr, Martin, 4,496,476, Cl. 252-522.00R.

Rohr, Wolfgang: *See—*
Plath. Peter; Rohr, Wolfgang; and Wuerzer, Bruno, 4,496,391, Cl. 71-92.000.

Romi, Romeu, to Industrias Romi S/A. Automatic uncoupling device. 4,495,843, Cl. 82-23.000.

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Roncaglione, James W.; and Roncaglione, Daniel E., 4,495,667, Cl. 15-53.00A.

Roncaglione, James W.; and Roncaglione, Daniel E., to Caravelle Industries, Inc. Vehicle washing apparatus. 4,495,667, Cl. 15-53.00A.

Rosaen, Borje O. Flexible filter device with means to position filter bag. 4,496,459, Cl. 210-310.000.

Rosaen, Lars O., to Universal Filters, Inc. Bidirectional flow meter. 4,495,823, Cl. 73-861.760.

Rose, William H.; and Shaffer, David T., to AMP Incorporated. Single in-line package switch. 4,496,802, Cl. 200-5.00R.

Rosenquist, Niles R.; and Tyrell, John A., to General Electric Company. Compatibilization of polycarbonate blends. 4,496,693, Cl. 525-146.000.

Rosink, Albert, to Trutzschler GmbH & Co. KG. Method and apparatus for coiling fiber sliver. 4,495,677, Cl. 19-159.00R.

Ross, Donald R. Apparatus and a process for heating a material. 4,496,477, Cl. 252-629.000.

Rosslenbroich, Hans-Jurgen: *See—*
Kuhle, Engelbert; Brandes, Wilhelm; Rosslenbroich, Hans-Jurgen; and Klauke, Erich, 4,496,575, Cl. 514-390.000.

Roth, David A., to General Electric Company. Nuclear image display controller. 4,497,024, Cl. 364-414.000.

Rothgery, Eugene F.: *See—*
Henderson, Richard; Rothgery, Eugene F.; and Schroeder, Hansjuergen A., 4,496,559, Cl. 514-188.000.

Rousey, James R. Bidirectional plumb bob level. 4,495,707, Cl. 33-392.000.

Rowell, Frank J. Containers and machine for making them. 4,495,748, Cl. 53-449.000.

Rowles, Howard C.: *See—*
Geist, Jacob M.; Vines, Harvey L.; Alvarez, Miguel R.; Rowles, Howard C.; and Woodward, Donald W., 4,496,382, Cl. 62-31.000.

Rowlette, John R.: *See—*
Dery, Ronald A.; Jones, Warren C.; Lynn, William J.; and Rowlette, John R., 4,496,422, Cl. 156-306.600.

Rozner, Alexander G.; Lenko, Daniel S.; and Carter, James H., to United States of America, Navy. Pyro-gun. 4,495,848, Cl. 89-1.100.

Rozycki, Marek: *See—*
Porter, James A., Jr.; Shivers, Joe D.; Rozycki, Marek; and Johnston, Otis, 4,496,015, Cl. 180-9.260.

Rubber-En Kuststoffabriek Enbi B.V.: *See—*
Delhaes, Johannes C., 4,495,683, Cl. 29-119.000.

Ruckstuhl, Willi, to Kronimus & Sohn GmbH & Co. KG, a part interest. Curved like paving stone element for use in setting a curved paving. 4,496,266, Cl. 404-41.000.

Rudy, N. Jerome. Integrally bonded compositions of cellulosics and products thereof directly from wet sawdust and the like. 4,496,718, Cl. 536-56.000.

Ruff, Stanley. Plasterboard trimming tool. 4,495,697, Cl. 30-294.000.

Ruhle, Walter, to Robert Bosch GmbH. Starter for internal combustion engines. 4,495,825, Cl. 74-7.00E.

Rumsey, Steven C., to American Standard Inc. Vigilance safety control system. 4,496,193, Cl. 303-19.000.

Ruwart, Mary J.: *See—*
Renis, Harold E.; and Ruwart, Mary J., 4,496,587, Cl. 514-573.000.

Ruzek, Ivo: *See—*
Hartmann, Ludwig; Ruzek, Ivo; and Locher, Engelbert, 4,496,508, Cl. 264-167.000.

Rye, Grover W.: *See—*
Brandyberry, Dennis R.; and Rye, Grover W., 4,495,759, Cl. 57-58.520.

Sachelaire, Toma: *See—*
Apetrei, Constantin; Nitigus, Victor; Elek, Demeter; Radulescu, Marian; and Sachelaire, Toma, 4,496,864, Cl. 310-77.000.

Sachse, Christian, to Electrotechnik-Apparatebau Peter Schmitz. Lighting device. 4,497,016, Cl. 362-294.000.

Sachse, Richard: *See—*
Machler, Meinrad; Sachse, Richard; Stacklies, Horst; and Schindler, Achim, 4,496,416, Cl. 156-293.000.

Sagami Chemical Research Center: *See—*
Tsuchihashi, Genichi; Mitamura, Shuichi; Kitajima, Koji; and Kobayashi, Kumi, 4,496,755, Cl. 560-028.000.

Sagara, Hisao: *See—*
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Sagaser, Thomas M.; Kuhn, Patrick; and Brock, Knute K., to Clark Equipment Company. Hydrostatic control system. 4,495,770, Cl. 60-486.000.

Sahara, Masayoshi: *See—*
Nakai, Masaaki; Sahara, Masayoshi; Hosomizu, Hiroshi; and Ishida, Tokuji, 4,496,230, Cl. 354-416.000.

Saijyo, Yoshihiro: *See—*
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Saito, Masami: *See—*
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Saito, Takao: *See—*
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Sakai, Kazunori: *See—*
Kato, Takaaki; Hirano, Yoshio; Ochiai, Takeshi; Ishikawa, Seizi; and Sakai, Kazunori, 4,497,057, Cl. 371-29.000.

Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Focusing state discriminating system. 4,496,832, Cl. 250-201.000.

Sakai, Shiro; and Ebisawa, Etsuo, to Sakai, Shiro; and Sakai, Sumiko. Process for preparing mustard flour. 4,496,598, Cl. 426-417.000.

Sakai, Sumiko: *See—*
Sakai, Shiro; and Ebisawa, Etsuo, 4,496,598, Cl. 426-417.000.

Sakaino, Michio; Igarashi, Hisashi; and Taniguchi, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for facilitating engine starting. 4,495,904, Cl. 123-179.00G.

Sakamoto, Junji; and Kishi, Hiroyasu, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Noise detecting circuit and television receiver employing the same. 4,496,978, Cl. 358-155.000.

Sakata, Akihiro: *See—*
Okazaki, Toshimasa; Sakata, Akihiro; Nagai, Kyozi; and Nakashima, Kazuo, 4,496,442, Cl. 204-129.000.

Sakata, Hideo; and Saito, Masami, to Mitutoyo Mfg. Co., Ltd. Coordinate measuring instrument. 4,495,703, Cl. 33-174.00L.

Sakata, Hideo, to Mitutoyo Mfg. Co., Ltd. Touch signal probe. 4,496,807, Cl. 200-61.420.

Sakato, Naoyuki; and Kitagaki, Tetsuo, to Shin-Etsu Chemical Co., Ltd. Method for shaping green body of ceramic powder and ceramic body obtained by firing same. 4,496,506, Cl. 264-109.000.

Sako, Yoichiro; and Odaka, Kentaro, to Sony Corporation. Method of error correction. 4,497,058, Cl. 371-39.000.

Sakurai, Kazuhiro: *See—*
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,496,134, Cl. 251-65.000.

Sakurai, Masaki: *See—*
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Sakurai, Yojiro: *See*—
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Salminen, Kari; and Soderholm, Nils, to Oy Tampella Ab. Extended nip press for a paper machine. 4,496,429, Cl. 162-358.000.

Salomon, Georges P. J.; and Quellais, Jacques, to Salomon S.A. Step-in ski binding. 4,496,169, Cl. 280-615.000.

Salomon S.A.: *See*—
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Salour, Michael M.; and Fuchs, Adrian, to United States of America, Air Force. Transmissive Dewar cooling chamber for optically pumped semiconductor ring lasers. 4,495,782, Cl. 62-514.00R.

Sam Stein Associates, Inc.: *See*—
Booth, Raymond E.; and Miller, Michael E., 4,496,084, Cl. 222-282.000.

Sampson, Edward J.: *See*—
Prosl, Frank R.; and Sampson, Edward J., 4,496,343, Cl. 604-86.000.

Sanchez, Gabriel A.: *See*—
Hemming, Leland H.; and Sanchez, Gabriel A., 4,496,950, Cl. 343-18.00A.

Sander, Wilfried; and Mielke, Siegfried, to Karl Schmidt GmbH. Process of joining a ceramic insert which is adapted to be embedded in a light metal casting for use in internal combustion engines. 4,495,684, Cl. 29-156.50R.

Sanders Associates, Inc.: *See*—
Baer, Ralph H., 4,496,158, Cl. 273-312.000.

Sanders, Rudolf; and Rijckaert, Josephus F., to U.S. Philips Corporation. Electric lamp having a mechanically connected lamp cap. 4,496,874, Cl. 313-318.000.

Sanderson, William R., to Interox Chemicals Limited. Hydrogen peroxide compositions. 4,496,473, Cl. 252-186.410.

Sandham, H. James; and Balanyk, Thomas E., to University of Toronto Innovations Foundation. Benzoin antimicrobial dental varnishes. 4,496,322, Cl. 433-217.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,495,783, Cl. 68-5.00D.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for continuous wet-heat treatment of cloth. 4,495,783, Cl. 68-5.00D.

Sandoz Ltd.: *See*—
Bauer, Wilfried; and Plesa, Janos, 4,496,543, Cl. 514-11.000.
Stakelbeck, Hans-Peter, 4,496,364, Cl. 8-641.000.

Sangster, George G. Linking means. 4,496,262, Cl. 403-335.000.

Sankyo Company, Limited: *See*—
Amemiya, Shigeo; and Kojima, Koichi, 4,496,745, Cl. 549-215.000.

Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Jun-ichi; Oya, Masayuki; and Iso, Tadashi, 4,496,578, Cl. 514-423.000.

Santilli, Donald S.; and Zones, Stacey I., to Chevron Research Company. Selective conversion of methanol to low molecular weight olefins over high silica SSZ-13 zeolite. 4,496,786, Cl. 585-640.000.

Sanyo Electric Co., Ltd.: *See*—
Sakamoto, Junji; and Kishi, Hiroyasu, 4,496,978, Cl. 358-155.000.

Sarrantonio, Albert: *See*—
Renshaw, Theodore A.; and Sarrantonio, Albert, 4,496,095, Cl. 228-102.000.

Sarrazin, Jean-Michel; and Chessel, Bernard, to Compagnie des Produits Industriels de l'Ouest. Window with integral molded frame and process for making same. 4,495,740, Cl. 52-309.100.

Sasaki, Kiichi; Kawade, Tateo; and Nemoto, Seiichiro, to Honda Giken Kogyo Kabushiki Kaisha. Seat belt device for vehicles. 4,496,170, Cl. 280-801.000.

Sase, Masatoshi; Onga, Makoto; and Yamanaka, Seisuke, to Sony Corporation. Sample hold circuit for an image pick-up device. 4,496,967, Cl. 358-44.000.

Sato, Akio: *See*—
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Sato, Eiji: *See*—
Arai, Nobukatsu; Machida, Shigeru; Sato, Eiji; Tojo, Kenji; and Uchikawa, Naoshi, 4,496,296, Cl. 418-55.000.

Sato, Hideo: *See*—
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Sato, Mitsuya: *See*—
Isohata, Junji; and Sato, Mitsuya, 4,496,239, Cl. 355-30.000.

Sato, Susumu: *See*—
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Satoh, Kenji: *See*—
Terada, Toshimichi; Komatsu, Keiichi; Shibata, Akira; and Satoh, Kenji, 4,497,000, Cl. 360-70.000.

Satoh, Yoichi, to Nippon Carburetor Co., Ltd. Carburetor assembly. 4,496,497, Cl. 261-41.00D.

Sattler, Frank A., to Westinghouse Electric Corp. Amide-imide-ester wire enamels. 4,496,715, Cl. 528-288.000.

Saunders, Frances C.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,496,221, Cl. 350-349.000.

Savage, Howard T., to United States of America, Navy. Long line hydrophone. 4,497,046, Cl. 367-169.000.

Savins, Joseph G., to Mobil Oil Corporation. Method for improving cuttings transport in deviated wells. 4,496,012, Cl. 175-65.000.

Savolskis, Edward P., to PPG Industries, Inc. Port wall air jet for controlling combustion air. 4,496,315, Cl. 432-30.000.

Sawatani, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Salient-pole rotor of a rotary electric machine. 4,496,863, Cl. 310-61.000.

Scarpini, Manuela, to Interbrev S.A. Slide-fastener half and method of making same. 4,495,679, Cl. 24-414.000.

Schachter, Friedrich. Liquid gas-operated lighter, particularly pocket lighter. 4,496,309, Cl. 431-344.000.

Schaefer, Klaus-Dieter: *See*—
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Schafer, Paul; and Berendt, Hans-Ulrich, to Ciba-Geigy Corporation. Process for bleaching cellulosic fibre materials using oligomers of phosphonic acid esters as stabilizers in alkaline, peroxide-containing bleaching liquors. 4,496,472, Cl. 252-186.220.

Schavilje, Robert: *See*—
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Schefczik, Ernst: *See*—
Bergmann, Udo; Dix, Johannes P.; Hansen, Guenter; and Schefczik, Ernst, 4,496,480, Cl. 534-794.000.

Schenck, Stephen R.: *See*—
Andresen, Bernhard H.; Schenck, Stephen R.; and Kennedy, Nathan R., 4,496,914, Cl. 331-110.000.

Schering Corporation: *See*—
Kwan, Henry K., 4,496,537, Cl. 424-85.000.

Scherschlicht, Richard R.; and Tissot, Rene , to Hoffmann-La Roche Inc. Nonapeptide for treating addictive drug withdrawal conditions. 4,496,545, Cl. 514-16.000.

Schickel, Alfred, to Veb Schwermaschinenbau-Kombinat "Ernst Thalmann" Magdeburg. Rotor-type magnetic particle separator. 4,496,457, Cl. 209-223.00R.

Schinbeckler, Steven E. Fireplace insert and method. 4,495,933, Cl. 126-123.000.

Schindler, Achim: *See*—
Machler, Meinrad; Sachse, Richard; Stacklies, Horst; and Schindler, Achim, 4,496,416, Cl. 156-293.000.

Schirmer, Henry G., to W. R. Grace & Co., Cryovac Div. Process for forming oriented multi-layer films having a different orientation distribution between layers. 4,496,516, Cl. 264-514.000.

Schlegel, Donald C.; and Bell, Malcolm R., to Sterling Drug Inc. Benzyl alcohol derivatives, their preparation and use. 4,496,590, Cl. 514-646.000.

Schlumberger, Etienne, to Medical Devices, Inc. Process and system for analyzing discontinuities in reasonably homogeneous medium. 4,495,816, Cl. 73-600.000.

Schlumberger Technology Corporation: *See*—
Chapman, Joseph E., III, 4,496,010, Cl. 175-4.550.
DerMott, Raymond W.; and Hartwein, Kenneth J., 4,496,009, Cl. 175-4.520.
Pottier, Alain; and Chesnel, Pierre, 4,496,008, Cl. 175-4.600.

Schmidt, John D. Camera support. 4,496,228, Cl. 354-293.000.

Schmidt, Rudiger: *See*—
Quittkat, Wolfram; Reuter, Gerhard; and Schmidt, Rudiger, 4,496,313, Cl. 432-14.000.

Schmidt, Thomas R., to Shell Oil Company. Fluid flow meter. 4,495,822, Cl. 73-861.270.

Schmieder, Heinrich: *See*—
Humbrecht, Remy; and Schmieder, Heinrich, 4,496,716, Cl. 528-295.000.

Schmiegel, Walter W., to Du Pont de Nemours, E. I., and Company. Curable fluoropolymer containing aromatic amine. 4,496,682, Cl. 524-545.000.

Schnabel, Wilhelm J.: *See*—
O'Connor, James M.; and Schnabel, Wilhelm J., 4,496,684, Cl. 524-591.000.

Schneider, Daniel E. QREEG Process matrix synchronizer system. 4,495,950, Cl. 128-670.000.

Schneider, Egon: *See*—
Kronseder, Hermann; and Schneider, Egon, 4,496,040, Cl. 198-434.000.

Schneider, Jurgen: *See*—
Kasper, Willi; Licht, Helmut; Raquet, Erwin; and Schneider, Jurgen, 4,496,183, Cl. 295-7.000.

Schoenig, Frederick C., Jr.; Grossman, Leonard N.; Lai, Ching C.; Masaitis, William; and Canada, Robert O., to General Electric Company. Automated inspection system. 4,496,056, Cl. 209-539.000.

Schoenmakers, Johannes J. M., to U.S. Philips Corporation. Magnetic-tape cassette with pivotal, nesting cover. 4,497,008, Cl. 360-132.000.

Schorcht, Adelbrecht; Klingenfeld, Dietmar; Hesse, Reiner; Dastis, Rainer; and Linz, Volker, to Jenoptik Jena G.m.b.H. Arrangement for the automatic adjustment of at least one object. 4,496,970, Cl. 358-101.000.

Schram, Joseph G., to Xerox Corporation. Release agent management system for heat and pressure fuser apparatus. 4,496,234, Cl. 355-3.0FU.

Schrekeis, Josef; and Murphy, Gerard P., to University of Illinois, The Board of Trustees of The. Adjustable collet. 4,496,165, Cl. 279-46.00R.

Schrenk, Jurgen: *See*—
Lill, Helmut; Schrenk, Jurgen; and Wunderwald, Peter, 4,496,653, Cl. 435-7.000.

Schroeder, Hansjuergen A.: *See*—
Henderson, Richard; Rothgery, Eugene F.; and Schroeder, Hansjuergen A., 4,496,559, Cl. 514-188.000.

Schron, Steven M., to Xerox Corporation. Consumable status display. 4,496,237, Cl. 355-14.00C.

Schubert, Werner: *See*—
Oestreich, Ulrich; and Schubert, Werner, 4,496,214, Cl. 350-96.230.

Schuette, Donald K.: *See*—
Reichert, Gilbert A.; and Schuette, Donald K., 4,496,791, Cl. 174-51.000.

Schuh, Bernhard: *See*—
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Schulten, Rudolf: *See*—
Behr, Friedrich; Schulten, Rudolf; and Weirich, Walter, 4,496,373, Cl. 55-16.000.

Schulz, Werner W. Biomembrane demonstration apparatus. 4,496,324, Cl. 434-295.000.

Schwager, Frederic A.; and Kainsinger, Willis C., to Mattel, Inc. Flexible track. 4,496,100, Cl. 238-10.00R.

Schwartzberg, Robert B. Game apparatus utilizing controllable audio signals. 4,496,149, Cl. 273-1.00E.

Schweizer, Hartmut: *See*—
Krauter, Immanuel; and Schweizer, Hartmut, 4,495,931, Cl. 123-651.000.

Schwenninger, Ronald L.: *See*—
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Schwob, Robert J. Adjustable window grill. 4,495,979, Cl. 160-226.000.

SCM Corporation: *See*—
Miller, Donald E.; Gilmore, Cecilia; Dimler, Steven R.; and Werstak, Charles E., 4,496,602, Cl. 426-555.000.

Scobie, William B., to Keystone International, Inc. Alignment maintaining apparatus for trunnion mounted valves. 4,496,135, Cl. 251-308.000.

Scott, James B.; and Radd, Fred J., to Conoco Inc. Well completion system and process. 4,495,997, Cl. 166-285.000.

Scott, Robert J.: *See*—
McNutt, James E.; Scott, Robert J.; and Welch, Charles W., 4,496,612, Cl. 427-310.000.

Scripps Clinic and Research Foundation: *See*—
Coppersmith, Ward J.; and LaMotte, George B., III, 4,496,657, Cl. 435-287.000.

Sears, Ronald E., to Transpec, Inc. Vehicle hatch mounting assembly. 4,495,731, Cl. 49-402.000.

Seberg, Charles H.: *See*—
Genese, Joseph N.; and Seberg, Charles H., 4,496,348, Cl. 604-167.000.

Sebrn Corporation: *See*—
Braun, Leon, 4,497,041, Cl. 364-900.000.

Seisakusho Kabushiki Kaisha Toyoda Jidoshokki: *See*—
Suzuki, Hajime; and Shiraki, Masao, 4,495,971, Cl. 139-435.000.

Sekiguchi, Yoshitoshi: *See*—
Okigami, Noboru; Hayasaka, Hiroshi; Sekiguchi, Yoshitoshi; and Tamura, Harushige, 4,496,306, Cl. 431-8.000.

Seko, Yasutoshi; Yanagishima, Takayuki; and Inoue, Masami, to Nissan Motor Company, Limited. Drowsiness alarm system for a vehicle. 4,496,938, Cl. 340-576.000.

Selenia, Industrie Elettroniche Associate, S.p.A.: *See*—
Bettini, Giuliano; Penso, Luigi; and Rodriguez, Giuseppe, 4,496,949, Cl. 343-7.700.

SenGupta, Achintya K., to Lever Brothers Company. Separation process and products obtained thereby. 4,496,489, Cl. 260-428.500.

Sennewald, Jurgen: *See*—
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Sepelak, Dennis J.: *See*—
Kanner, Bernard; Hopper, Steven P.; and Sepelak, Dennis J., 4,496,754, Cl. 556-420.000.

Sergenian, Haig H.: *See*—
Rispoli, Joseph M.; Rogers, Morris A.; Sergenian, Haig H.; Swartley, John S.; and Topalian, Harry, 4,496,601, Cl. 426-554.000.

Serpa, Richard E., to Smith International, Inc. Prevention of cone seal failures in rock bits. 4,496,013, Cl. 175-374.000.

Setescak, Linda L.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,496,580, Cl. 514-443.000.

Shaban, Atef M.: *See*—
Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., 4,496,777, Cl. 568-850.000.

Shaffer, David T.: *See*—
Rose, William H.; and Shaffer, David T., 4,496,802, Cl. 200-5.00R.

Shah, Rajiv R., to Texas Instruments Incorporated. Apparatus and method for photolithography with phase conjugate optics. 4,496,222, Cl. 350-354.000.

Shaheen, Joseph M.; and Yancey, Herbert W., to Rockwell International Corporation. Fiber optic cable. 4,496,215, Cl. 350-96.230.

Shapiro, Aron B.: *See*—
Antonov, Jury F.; Iogansen, Vadim I.; Tkachenko, Alexei S.; Chernyavsky, Vladimir P.; and Shapiro, Aron B., 4,496,870, Cl. 310-260.000.

Shapiro, Seymour W., to Bivona Surgical Instruments, Inc. Tracheal tubes. 4,495,948, Cl. 128-207.150.

Sharp Kabushiki Kaisha: *See*—
Arai, Nobushige, 4,495,939, Cl. 126-450.000.
Deguchi, Toshihisa; Ohta, Kenji; and Takahashi, Akira, 4,497,006, Cl. 360-114.000.
Watanabe, Masanori; Furubayashi, Hisatoshi; Tanaka, Junichi; and Hijikigawa, Masaya, 4,496,931, Cl. 338-34.000.

Sharps, Gordon V., Jr., to Mobil Oil Corporation. Method of forming a blocked cross-plied polymer film. 4,496,413, Cl. 156-244.130.

Shaw, David N., to Dunham-Bush, Inc. Temperature and pressure actuated capacity control system for air conditioning system. 4,495,778, Cl. 62-209.000.

Shaw, Seth T., Jr. IUD Arrangement. 4,495,934, Cl. 128-130.000.

Shazeer, Dov. Whirley balls amusement device. 4,496,154, Cl. 273-109.000.

Sheber, Thomas F. Embossed concrete building panels. 4,495,738, Cl. 52-204.000.

Shechter, Leon: *See*—
Munteanu, Marina A.; Oltarzewski, Edward S.; Shechter, Leon; and Warren, Craig B., 4,496,467, Cl. 252-92.000.

Shell, Donald H.: *See*—
Pate, Harold T.; Laney, William R.; and Shell, Donald H., 4,495,970, Cl. 138-148.000.

Shell Oil Company: *See*—
DerMott, Raymond W.; and Hartwein, Kenneth J., 4,496,009, Cl. 175-4.520.
Edwards, Charles L.; and Wilson, Stanley E., 4,496,776, Cl. 568-827.000.
Fischer, Ferdinand J., III, 4,495,808, Cl. 73-432.00R.
Harryman, John M., 4,496,380, Cl. 62-24.000.
Schmidt, Thomas R., 4,495,822, Cl. 73-861.270.

Sherby, James E., to PPG Industries, Inc. Pattern cutter. 4,495,845, Cl. 83-886.000.

Sherif, Fawzy G.; Majewski, Helmut W.; and Via, Francis A., to Stauffer Chemical Company. Dicalcium phosphate dihydrate having improved monofluorophosphate compatibility and process for the preparation thereof. 4,496,527, Cl. 423-309.000.

Shibakawa, Riichiro: *See*—
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Shibata, Akira; Konosu, Makoto; Tamura, Teizo; Hirose, Koichi; Miura, Kuniaki; Kojima, Noboru; and Komatsu, Keiichi, to Hitachi, Ltd. Picture reproducing apparatus in a helical scanning video tape recorder. 4,497,004, Cl. 360-108.000.

Shibata, Akira: *See*—
Terada, Toshimichi; Komatsu, Keiichi; Shibata, Akira; and Satoh, Kenji, 4,497,000, Cl. 360-70.000.

Shieh, Steve. Strap for use with diving goggles. 4,495,663, Cl. 2-422.000.

Shiel, Leslie E.: *See*—
Vas, Gerson M. F.; and Shiel, Leslie E., 4,496,670, Cl. 523-205.000.

Shigaki, Masanobu, to Kabushiki Kaisha Takuma. Incinerator and method of reducing NO_x emissions. 4,495,872, Cl. 110-190.000.

Shimada, Masayoshi; Iizuka, Yasuhiro; and Hukazu, Tetuo, to Toyo Boseki Kabushiki Kaisha. Electrode for flowcell. 4,496,637, Cl. 429-44.000.

Shimada, Satoshi; Yamada, Kazuji; Suzuki, Seikou; and Nishihara, Motohisa, to Hitachi, Ltd. Capacitive pressure sensor. 4,495,820, Cl. 73-724.000.

Shimago, Kozo: *See*—
Ohashi, Naohito; Shimago, Kozo; Ikeda, Takaharu; and Ishizumi, Kikuo, 4,496,739, Cl. 548-321.000.

Shimizu, Haruo: *See*—
Tsukada, Masaharu; Kimizuka, Junichi; and Shimizu, Haruo, 4,496,238, Cl. 355-14.00D.

Shimizu, Isao: *See*—
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Shimizu, Keiichi: *See*—
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Shimofuri, Koichi, to Todo Seisakusho Ltd. Method and apparatus for automatically preparing flexible, disposable packing containers. 4,495,747, Cl. 53-412.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Okada, Fumio; Oba, Toshio; and Nakazato, Morizo, 4,496,687, Cl. 524-859.000.
Sakato, Naoyuki; and Kitagaki, Tetsuo, 4,496,506, Cl. 264-109.000.

Shinko Electric Co., Ltd.: *See*—
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Shinoda, Kazuo; and Kobayashi, Nobuyuki, to Toyota Jidosha Kabushiki Kaisha. Fuel injection device for internal combustion engine. 4,495,915, Cl. 123-357.000.

Shinoda, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Fuel injection pump control system in diesel engine. 4,495,916, Cl. 123-387.000.

Shinoda, Nobuhiko: *See*—
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,496,832, Cl. 250-201.000.

Shinohara, Tatsuoki, to Fuji Xerox Co., Ltd. Vocal indicating device of copying machine. 4,497,032, Cl. 364-513.500.

Shipley, Randall S., to Dow Chemical Company, The. High efficiency catalyst for polymerizing olefins. 4,496,661, Cl. 502-115.000.

Shirai, Ei: *See*—
Yoshida, Mamoru; Yokoo, Hidejiro; and Shirai, Ei, 4,496,585, Cl. 514-514.000.

Shirai, Masanari: *See*—
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Shiraki, Masao: *See*—
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Shirano, Kenji: *See*—
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, 4,496,714, Cl. 528-272.000.
Shiroki, Hiroyuki: *See*—
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Shivers, Joe D.: *See*—
Porter, James A., Jr.; Shivers, Joe D.; Rozycki, Marek; and Johnston, Otis, 4,496,015, Cl. 180-9.260.
Shore, Sheldon G.; and Bhattacharyya, Alakananda, to Ohio State University Research Foundation, The. Ruthenium carbonylates and processes for their preparation. 4,496,532, Cl. 423-417.000.
Showa Denko Kabushiki Kaisha: *See*—
Kobayashi, Yukio; Kira, Masaaki; and Yamaguchi, Kinya, 4,496,640, Cl. 429-213.000.
Yoshida, Mamoru; Yokoo, Hidejiro; and Shirai, Ei, 4,496,585, Cl. 514-514.000.
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Murakami, Muneo; and Ishizaki, Zentaro, 4,495,855, Cl. 92-71.000.
Shulyak, Lev. Shear. 4,496,276, Cl. 225-65.000.
Shum, Yick-Mow: *See*—
Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,495,994, Cl. 166-261.000.
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Sieben, Joannes H. F. C., to U.S. Philips Corporation. Magnetic-tape cassette with simplified reel brake. 4,496,119, Cl. 242-198.000.
Siegfried, Schleicher: *See*—
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Siemens Aktiengesellschaft: *See*—
Diepold-Scharnitzky, Rudolf; Lesche, Wolfgang; and Rindfleisch, Volker, 4,497,038, Cl. 364-900.000.
Lenz, Michael, 4,496,911, Cl. 330-297.000.
Oestreich, Ulrich; and Schubert, Werner, 4,496,214, Cl. 350-96.230.
Pfleiderer, Hans-Joerg; and Herbst, Heiner, 4,496,980, Cl. 358-212.000.
Sieveking, Robert. Hollow metal door mortiser and method of using same. 4,495,687, Cl. 29-426.100.
Sievers, Richard W., to Spiral Tubing Corporation. Multiple coil heat exchanger. 4,495,989, Cl. 165-172.000.
Sigworth, Harrison W., Jr., to Chevron Research Company. Vacuum system for reducing heat loss. 4,496,001, Cl. 166-387.000.
Sillner, Georg. Device for retaping electrical components. 4,495,973, Cl. 140-102.000.
Silver, David M.; and Dehaas, Newman, to Johns Hopkins University, The. Cryogenic tank support system. 4,496,073, Cl. 220-445.000.
Silver Engineering Works, Inc.: *See*—
Vertenstein, Mathieu J.; and Amerigian, Albert A., 4,496,199, Cl. 384-474.000.
Silverman, Daniel. Seismic wave generator. 4,497,044, Cl. 367-41.000.
Simpson, Roy G., to Adams Plastics. Control halter with sliding headpiece. 4,495,752, Cl. 54-24.000.
Simpson, Roy G., to Adams Plastics, Inc. Control halter. 4,495,753, Cl. 54-24.000.
Singh, Prithipal: *See*—
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Sinner, Bengt: *See*—
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Sipple, Kenneth J.: *See*—
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Sirkin, Eric R.: *See*—
Biegelsen, David K.; and Sirkin, Eric R., 4,496,608, Cl. 427-53.100.
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, to USV Pharmaceutical Corporation. N-substituted-amidoamino acids. 4,496,542, Cl. 514-2.000.
Skillman, Harry L., Jr.: *See*—
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Skipka, Guido; Alles, Hans-Ulrich; Randau, Gert; and Niese, Manfred, to Bayer Aktiengesellschaft. Process for the preparation of 4-amino-3-methyl-phenol. 4,496,764, Cl. 564-418.000.
Skyline Products, Inc.: *See*—
Stadjuhar, Robert C.; and Renfro, Cecil S., 4,496,945, Cl. 340-764.000.
Smith, Albert W. Cylinder displaceable power swivel for a portable drilling apparatus and a process therefor. 4,496,006, Cl. 173-28.000.
Smith, Herman W., to Upjohn Company, The. Analogs of 5,6-dihydro PGI_2. 4,496,742, Cl. 548-516.000.
Smith International, Inc.: *See*—
Serpa, Richard E., 4,496,013, Cl. 175-374.000.
Smith, John D.: *See*—
Dawes, Cyril; and Smith, John D., 4,496,401, Cl. 148-16.500.
Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; and Ife, Robert J., 4,496,567, Cl. 514-272.000.
Smith, Merrill M.; and Ferguson, Donald C., to American Biltrite, Inc. Method of forming a backing material. 4,496,414, Cl. 156-246.000.
Smith, Michael D., to Motorola, Inc. Frequency to voltage converter. 4,496,858, Cl. 307-519.000.
Smith, Peter H., to General Electric Company. Automatic fire detection for a microwave oven. 4,496,817, Cl. 219-10.55M.
Smith, Reginald W.: *See*—
Orcutt, John W.; Hightower, Angus W.; and Smith, Reginald W., 4,496,965, Cl. 357-70.000.
Smith, Roger C.: *See*—
Freitag, Gary T.; and Smith, Roger C., 4,495,840, Cl. 81-54.000.
Smith, T. Basil, to Charles Stark Draper Laboratory, Inc., The. Multichannel redundant processing systems. 4,497,059, Cl. 371-36.000.
Smith, Thomas W.; Cheng, David; and Ward, Anthony T., to Xerox Corporation. Optical disk. 4,496,957, Cl. 346-135.100.
Smith, William D., to Key Concepts, Incorporated. Data entry switch. 4,496,803, Cl. 200-5.00A.
Smithkline Beckman Corporation: *See*—
DeMarinis, Robert M.; Hieble, Jacob P.; and Matthews, William D., 4,496,558, Cl. 514-213.000.
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Snider, Scott C.; and DeLeon, Alberto, to Celotex Corporation, The. Alkoxylated aromatic amine-aromatic polyester polyol blend and polyisocyanurate foam therefrom. 4,496,625, Cl. 428-318.400.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
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Soderholm, Nils: *See*—
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Soika, Emil H., to Baxter Travenol Laboratories, Inc. Cannula support assembly and its method of manufacture. 4,496,352, Cl. 604-263.000.
Solarex Corporation: *See*—
Whitehouse, Daniel L., 4,496,398, Cl. 106-181.000.
Sollami, Phillip. Rotary actuator. 4,495,856, Cl. 92-125.000.
Sommer Co.: *See*—
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Sommer, Gordon M., to Sommer Co. Brake unit. 4,496,032, Cl. 188-180.000.
Sonoda, Nobuo: *See*—
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Sony Corporation: *See*—
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Maeyama, Sadao; Dochi, Kiyotaka; and Honda, Shigemichi, 4,496,955, Cl. 346-76.0PH.
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Southerland, Ebbin R., Jr., to Texas Instruments Incorporated. Dynamic metal oxide semiconductor field effect transistor clocking circuit. 4,496,851, Cl. 307-269.000.
Sowell, Donald L.: *See*—
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Spamer, William S., to Mead Corporation, The. Gravity-feed shelf and components therefor. 4,496,037, Cl. 193-2.00R.
Sparks, Moses, Jr.: *See*—
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Spectral Sciences Incorporated: *See*—
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Spectrascan, Inc.: *See*—
Stoller, Milton, 4,495,949, Cl. 128-664.000.
Spencer, David E., to Square D Company. Self-anchoring poke-thru wiring device. 4,496,790, Cl. 174-48.000.
Sperry Corporation: *See*—
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Ransom, Stephen A.; and Stickel, Tedd K., 4,496,856, Cl. 307-475.000.
Young, Peter L., 4,496,648, Cl. 430-312.000.
Spider Staging, Inc.: *See*—
Fisher, Harry S., 4,496,027, Cl. 182-142.000.
Spietschka, Ernst; and Urban, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of perylene-3,4,9,10-tetracarboxylic acid N,N'-dialkyldiimide pigments. 4,496,731, Cl. 546-37.000.
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Deatcher, John H.; and Goswami, Jagadish C., 4,496,628, Cl. 428-337.000.
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Sugiuchi, Masami; and Imai, Atsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid-electrolyte cell. 4,496,638, Cl. 429-192.000.
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Suste, Joseph T., to Interstate Electronics Corp. System for driving AC plasma display panel. 4,496,879, Cl. 315-169.400.
Suzuki, Hajime; and Shiraki, Masao, to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki. Weft inserting device for a jet loom. 4,495,971, Cl. 139-435.000.
Suzuki, Masaru; Iwata, Masayosi; Hayashi, Yoshikazu; and Yokoyama, Tadashi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Column mounted switching device for automobiles. 4,496,810, Cl. 200-61.540.
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Swanson, Ronald L.; and Strathman, Lyle R., to Rockwell International Corporation. Reduced memory graphics-to-raster scan converter. 4,496,976, Cl. 358-147.000.
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Swartzendruber, Ray E., to Chore-Time Equipment, Inc. Feed distribution apparatus. 4,495,894, Cl. 119-51.00R.
Sweeney, Charles T.; and Bird, John K., to Tetravalent Inc. Desulfurization of coal. 4,496,441, Cl. 204-98.000.
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Sykes, Philip K., to Blackbourn, Inc. Video cassette carrier. 4,496,048, Cl. 206-387.000.
Sykora, James H. Deep water hydrostatic head control. 4,495,999, Cl. 166-364.000.
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Takahashi, Hideyuki; Kenmotsu, Isami; and Okajima, Takahiro, to Pioneer Electronic Corporation. Automatic record loading player. 4,497,051, Cl. 369-77.100.
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Kondo, Koichi; Iwasa, Susumu; and Yoshida, Isamu, 4,496,658, Cl. 436-510.000.
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Takenaka, Yuji, to Fuji Photo Film Co., Ltd. Trimming area control system in photo-printing. 4,496,983, Cl. 358-287.000.
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Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Video tape recorder with delayed control signal recording upon restart. 4,496,998, Cl. 360-33.100.
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Talbott, Gene B. Seed germinating apparatus and method. 4,495,725, Cl. 47-85.000.
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Tamary, Ernest J., to Eastman Kodak Company. Fuser apparatus. 4,496,235, Cl. 355-3.0FU.
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Tamura, Teizo: *See—*
Shibata, Akira; Konosu, Makoto; Tamura, Teizo; Hirose, Koichi; Miura, Kuniaki; Kojima, Noboru; and Komatsu, Keiichi, 4,497,004, Cl. 360-108.000.
Tanaka, Isao; and Inaba, Takao, to Pilot Ink Co., Ltd. Writing pen with space behind nib. 4,496,258, Cl. 401-206.000.
Tanaka, Junichi: *See—*
Watanabe, Masanori; Furubayashi, Hisatoshi; Tanaka, Junichi; and Hijikigawa, Masaya, 4,496,931, Cl. 338-34.000.
Tanaka, Ko, to Yamaha Hatsudoki Kabushiki Kaisha. Offroad auto tricycle. 4,496,019, Cl. 180-215.000.
Tanaka, Tatsuo; Itoh, Hiroshi; and Sugiyama, Akihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Air conditioner. 4,495,779, Cl. 62-211.000.
Tanaka, Toshinori: *See—*
Morishita, Akira; Tanaka, Toshinori; Matsumoto, Kouichi; and Gotou, Takeo, 4,495,905, Cl. 123-179.00F.
Tanaka, Yasushi: *See—*
Ishii, Yoshiya; Hachitani, Shuji; and Tanaka, Yasushi, 4,495,914, Cl. 123-357.000.
Tanigawa, Yoshiyuki: *See—*
Nagata, Keiji; Ueda, Syuji; and Tanigawa, Yoshiyuki, 4,495,871, Cl. 108-20.000.
Taniguchi, Masajiro: *See—*
Zenitani, Hideki; Oka, Akira; Okamoto, Itsuo; Hayashi, Hisao; and Taniguchi, Masajiro, 4,496,057, Cl. 211-26.000.
Taniguchi, Yutaka: *See—*
Sakaino, Michio; Igarashi, Hisashi; and Taniguchi, Yutaka, 4,495,904, Cl. 123-179.00G.
Tanizaki, Hiroyuki; Ebihara, Sakae; Hatanaka, Akimitsu; Ogawa, Takayoshi; and Kanazawa, Yuzo, to Nissan Motor Company, Limited; Aichi Machine Industry Company, Limited; and Ikeda Bussan Company Limited. Seat device. 4,496,189, Cl. 297-63.000.
Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the production of a polyester fiber dyeable under normal pressure. 4,496,505, Cl. 264-101.000.
Taoka Chemical Company, Limited: *See—*
Nagasawa, Takashi; and Nakata, Tiaki, 4,496,685, Cl. 524-708.000.
Targan, Ronald G. Process for producing black barley malt extract. 4,496,605, Cl. 426-655.000.
Tashiro, Noboru: *See—*
Yamamoto, Sakuei; Nishida, Mitsuhiro; Tashiro, Noboru; and Sonoda, Nobuo, 4,496,866, Cl. 310-87.000.
Tatonetti, Mario B.: *See—*
Stratton, Leo M.; Sipple, Kenneth J.; and Tatonetti, Mario B., 4,495,815, Cl. 73-517.00B.
Taylor, John H., to McGard, Inc. Locking valve construction. 4,495,910, Cl. 123-198.00B.
Taylor, Julius E., Jr. Apparatus for aligning abutting pipes. 4,496,093, Cl. 228-49.00B.
Taylor, Junius E.: *See—*
Acker, Loren C.; Taylor, Junius E.; and Minney, Stephen C., 4,496,819, Cl. 219-10.810.
Tectron (Eng) Ltd.: *See—*
Needham, Arthur M.; and Helyer, Laurie E., 4,495,967, Cl. 137-614.060.
Teijin Limited: *See—*
Yamamoto, Tamio; Kobayashi, Tsukasa; Hirakawa, Tadashi; Yoshida, Makoto; and Okumura, Masumi, 4,496,583, Cl. 428-288.000.
Teiken, Gerald W.: *See—*
Markwardt, Terrance L.; and Teiken, Gerald W., 4,496,206, Cl. 339-98.000.
Tekippe, Vincent J., to Gould Inc. Optical pressure sensor. 4,495,819, Cl. 73-705.000.
Tektronix, Inc.: *See—*
Helton, Raymond L.; Trobough, Douglas W.; and McPherson, Marianne, 4,496,438, Cl. 204-44.000.
Tele-Drill, Inc.: *See—*
McDonald, William J.; Maurer, William C.; and Nagel, David D., 4,496,174, Cl. 285-53.000.
Teletype Corporation: *See—*
Hagstrom, Arthur A.; and Swanson, Carl D., 4,496,200, Cl. 312-208.000.
Terada, Toshimichi; Komatsu, Keiichi; Shibata, Akira; and Satoh, Kenji, to Hitachi, Ltd. Magnetic recording/reproducing apparatus. 4,497,000, Cl. 360-70.000.
Teramachi, Hiroshi. Linear slide bearing and linear slide table using this bearing. 4,496,196, Cl. 308-6.00C.
Terashima, Kazutaka; and Fukuda, Tsuguo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Technology. Method for manufacture of III–V compound semiconducting single crystal. 4,496,424, Cl. 156-601.000.
Teraura, Makoto, to Nippon Cable System Inc. Boat steering mechanism. 4,495,881, Cl. 114-159.000.
Terhune, James H., to General Electric Company. Magnetostrictive pressure detector. 4,495,821, Cl. 73-753.000.
Terranova, Joseph C., III: *See—*
Gattu, Narahari; and Terranova, Joseph C., III, 4,496,062, Cl. 212-189.000.
Terui, Masumi, to Takara Co., Ltd. Miniature toy vehicle assembly. 4,496,330, Cl. 446-464.000.
Tesco Engineering Company: *See—*
Miller, Sheldon M., 4,497,045, Cl. 367-78.000.
Teske, Lothar. Rotary arm-type unloader for bulk-storage bin. 4,496,272, Cl. 414-323.000.
Tessarzik, Juergen M.; Myers, Albert; and Yuille, James D., to General Electric Company. Probe mounting system. 4,495,810, Cl. 73-432.00R.
Tetra Pak Developpement SA: *See—*
Cheever, Richard N., 4,496,881, Cl. 315-357.000.
Tetra Systems, Inc.: *See—*
Hutchins, John S.; and DeFours, Mervyn A., 4,495,992, Cl. 166-250.000.
Tetravalent Inc.: *See—*
Sweeney, Charles T.; and Bird, John K., 4,496,441, Cl. 204-98.000.
Texaco Inc.: *See—*
Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,495,994, Cl. 166-261.000.
Dowling, Donald J.; Richter, Albert P., Jr.; Warren, Wayne F.; and Arnold, Dan M., 4,495,805, Cl. 73-155.000.
Kaufman, Benjamin J.; and Sung, Rodney L., 4,496,368, Cl. 44-63.000.
Powell, Justin C., 4,496,746, Cl. 549-255.000.
Texas Independent Tools and Unlimited Service, Inc.: *See—*
Weeks, Benjamin R., 4,496,000, Cl. 166-382.000.
Texas Instruments Incorporated: *See—*
Andresen, Bernhard H.; Schenck, Stephen R.; and Kennedy, Nathan R., 4,496,914, Cl. 331-110.000.
Gasparri, Alfred, Jr., 4,497,066, Cl. 382-48.000.
Kawate, Keith W.; and Strachan, Richard W., deceased, 4,496,895, Cl. 318-781.000.
Orcutt, John W.; Hightower, Angus W.; and Smith, Reginald W., 4,496,965, Cl. 357-70.000.
Shah, Rajiv R., 4,496,222, Cl. 350-354.000.
Southerland, Ebbin R., Jr., 4,496,851, Cl. 307-269.000.
Walstra, Hidde, 4,496,496, Cl. 261-39.00E.
Textrix Corporation: *See—*
McGuire, Richard; and Donhowe, Herbert M., 4,497,027, Cl. 364-471.000.
Tezuka, Masayoshi: *See—*
Kitakami, Hazime; Ishikawa, Hiroshi; Tezuka, Masayoshi; Adachi, Susumu; and Makinouchi, Akifumi, 4,497,039, Cl. 364-900.000.
Thate, Kurt; Farber, Heinrich; and Muller, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Arrangement for supplying unexposed X-ray films to a handling apparatus. 4,496,273, Cl. 414-411.000.
Thayer, William L.: *See—*
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinivasa, 4,496,502, Cl. 264-41.000.

The, Paul J.: *See*—
Bush, J. Finley; and The, Paul J., 4,496,524, Cl. 423-122.000.
Thermostat- und Schaltgeratebau GmbH & Co. KG: *See*—
Hollweck, Walter, 4,496,928, Cl. 337-94.000.
Thies GmbH & Co.: *See*—
Eckrodt, Gunter, 4,495,785, Cl. 68-62.000.
Thiokol Corporation: *See*—
Bell, Frank H., 4,495,870, Cl. 102-511.000.
Johnson, Dell A.; and Bolieau, Christopher W., 4,495,763, Cl. 60-242.000.
Thir, Basil: *See*—
Camp, Ronald L.; Dexheimer, Edward M.; and Thir, Basil, 4,496,632, Cl. 428-395.000.
Thomas & Betts Corporation: *See*—
Christensen, Gordon D.; and Donaher, Charles J., 4,496,205, Cl. 339-74.00R.
Thomas, Charles P.: *See*—
Chen, Hsiu Kuo; and Thomas, Charles P., 4,495,995, Cl. 166-273.000.
Thomasson, James T.: *See*—
Allen, Robert E.; and Thomasson, James T., 4,496,865, Cl. 310-80.000.
Thompson, David J.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,496,221, Cl. 350-349.000.
Thompson, Michael L.: *See*—
Forte, Don A.; and Thompson, Michael L., 4,496,905, Cl. 324-414.000.
Thomson-Brandt: *See*—
Pissot, Guy, 4,496,177, Cl. 292-87.000.
Thomson-CSF: *See*—
Alet, Robert; and Vignault, Eric, 4,496,323, Cl. 434-29.000.
Thorpe, William, to British Telecommunications. Radio frequency alternate-path phase switch. 4,496,918, Cl. 333-164.000.
Three Sisters Ranch Enterprises PTRs: *See*—
Bullock, Joseph J., III, 4,496,066, Cl. 215-320.000.
Thunberg, John Y. L.: *See*—
Lindahl, Ulf P. F.; Backstrom, Gudrun E.; and Thunberg, John Y. L., 4,496,550, Cl. 514-54.000.
Thune-Eureka A/S: *See*—
Eriksen, Gunnar, 4,495,714, Cl. 34-111.000.
Thyssen-Bornemisza Inc.: *See*—
Pate, Harold T.; Laney, William R.; and Shell, Donald H., 4,495,970, Cl. 138-148.000.
Tikhonov, Vladimir I.: *See*—
Nikolsky, Vladimir A.; Yagodin, Valery M.; Vazhnov, Evgeny N.; Bondar, Efim S.; Naumenko, Igor P.; Vozny, Valery F.; Orlov, Vladimir N.; and Tikhonov, Vladimir I., 4,495,776, Cl. 62-114.000.
Tischer, Werner; Liebert, Karl-Heinz; and Fassbender, Rolf, to Zahnradfabrik Friedrichshafen, AG. Booster power steering. 4,495,769, Cl. 60-451.000.
Tisdale, Glenn E.; and Lindemann, Harley B., to Westinghouse Electric Corp. Target recognition system enhanced by active signature measurements. 4,497,065, Cl. 382-1.000.
Tissot, Rene : *See*—
Scherschlicht, Richard R.; and Tissot, Rene , 4,496,545, Cl. 514-16.000.
Titus, Charles H.; Wittle, John K.; and Bell, Christy W., to Electro-Petroleum, Inc. Apparatus for passing electrical current through an underground formation. 4,495,990, Cl. 166-65.00R.
Tkachenko, Alexei S.: *See*—
Antonov, Jury F.; Iogansen, Vadim I.; Tkachenko, Alexei S.; Chernyavsky, Vladimir P.; and Shapiro, Aron B., 4,496,870, Cl. 310-260.000.
TMC Corporation: *See*—
Krob, Erwin; Leichtfried, Friedrich; and Bauer, Helmut, 4,496,167, Cl. 280-605.000.
Toagosei Chemical Industry Co., Ltd.: *See*—
Okazaki, Toshimasa; Sakata, Akihiro; Nagai, Kyozi; and Nakashima, Kazuo, 4,496,442, Cl. 204-129.000.
Tobishi Industries Ltd.: *See*—
Hosoya, Toshiro, 4,496,869, Cl. 310-172.000.
Todo Seisakusho Ltd.: *See*—
Shimofuri, Koichi, 4,495,747, Cl. 53-412.000.
Tojo, Kenji: *See*—
Arai, Nobukatsu; Machida, Shigeru; Sato, Eiji; Tojo, Kenji; and Uchikawa, Naoshi, 4,496,296, Cl. 418-55.000.
Tokai Kogyo Mishin Kabushiki Kaisha: *See*—
Tajima, Ikuo, 4,495,876, Cl. 112-103.000.
Tokico Ltd.: *See*—
Muto, Toshiaki; and Goto, Akio, 4,495,790, Cl. 72-326.000.
Tokumo, Akio, to Pioneer Electronic Corporation. Voltage-controlled attenuator. 4,496,860, Cl. 307-542.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Sakamoto, Junji; and Kishi, Hiroyasu, 4,496,978, Cl. 358-155.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Iizuka, Tetsuya; and Hara, Hisashi, 4,497,043, Cl. 365-182.000.
Ikeda, Yoshio, 4,495,784, Cl. 68-23.600.
Iwahashi, Hiroshi; Asano, Masamichi; Yoskikawa, Kuniyoshi; and Mito, Masazi, 4,495,693, Cl. 29-571.000.
Kirita, Kei; and Koike, Katuo, 4,496,843, Cl. 250-426.000.
Kitagawa, Kazuo; Endoh, Kenjiro; and Kira, Hideshi, 4,496,937, Cl. 340-347.0SH.
Kuno, Nobuyoshi; and Honda, Kiyokazu, 4,496,872, Cl. 313-113.000.
Nakano, Teruo; and Hirata, Akio, 4,496,893, Cl. 318-721.000.
Sugiuchi, Masami; and Imai, Atsuo, 4,496,638, Cl. 429-192.000.
Tanaka, Tatsuo; Itoh, Hiroshi; and Sugiyama, Akihiko, 4,495,779, Cl. 62-211.000.
Yoshihara, Setsuo; Otsubo, Yorihumi; and Kobayashi, Takashi, 4,496,830, Cl. 235-458.000.
Tomishima, Hitoshi: *See*—
Matsumura, Toshimi; Miyaki, Masahiko; Tomishima, Hitoshi; and Masuda, Akira, 4,495,920, Cl. 123-436.000.
Tompkins, L. Kirk, to Global Manufacturing Co. Inc. Multiple blast aerator system. 4,496,076, Cl. 222-3.000.
Tone, Junsuke: *See*—
Celmer, Walter D.; Cullen, Walter P.; Watts, Paul C.; Shibakawa, Riichiro; and Tone, Junsuke, 4,496,546, Cl. 514-29.000.
Tone, Syoichi; Deno, Koji; and Matsushima, Akio, to Murata Kikai Kabushiki Kaisha. Bunch winding device in winding machine. 4,496,108, Cl. 242-18.0PW.
Topalian, Harry: *See*—
Rispoli, Joseph M.; Rogers, Morris A.; Sergenian, Haig H.; Swartley, John S.; and Topalian, Harry, 4,496,601, Cl. 426-554.000.
Toray Industries, Inc.: *See*—
Adachi, Yasuo; and Nabae, Kiyoyuki, 4,496,631, Cl. 428-394.000.
Kawabe, Norio; Tsuda, Mikio; and Kobashi, Sadao, 4,496,647, Cl. 430-303.000.
Nakayama, Takashi; Kajita, Kohji; and Yamagata, Selichi, 4,495,761, Cl. 57-328.000.
Okamoto, Miyoshi, 4,496,619, Cl. 428-224.000.
Yoshinaga, Minoru; and Sumida, Atsushi, 4,496,671, Cl. 523-206.000.
Torii & Co. Ltd.: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Nunomura, Shigeki; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,496,584, Cl. 514-510.000.
Torneman, Bjorn, to IPS Interproject Service AB. Apparatus for gasification of carbon. 4,496,369, Cl. 48-92.000.
Torti, Anthony: *See*—
Comeau, Paul E.; and Torti, Anthony, 4,495,671, Cl. 16-87.00R.
Toshiba Kikai Kabushiki Kaisha: *See*—
Iwamoto, Norihiro, 4,495,828, Cl. 74-110.000.
Toshiba Silicone Co., Ltd.: *See*—
Kurita, Atsushi, 4,496,696, Cl. 525-479.000.
Totten, George E.; and Williams, Thomas C., to Union Carbide Corporation. Liquid crystal silanes. 4,496,482, Cl. 534-577.000.
Touchais, Maurice; and Djelalian, Madeleine. Method and device for collecting and exploiting solar radiation. 4,496,787, Cl. 136-248.000.
Towmotor Corporation: *See*—
Melocik, Grant C.; and Wible, John E., 4,496,896, Cl. 320-2.000.
Toyama, Jun. Support device. 4,496,130, Cl. 248-585.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Kurita, Kazuo; and Ishihara, Hideaki, 4,496,630, Cl. 428-364.000.
Shimada, Masayoshi; Iizuka, Yasuhiro; and Hukazu, Tetuo, 4,496,637, Cl. 429-44.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Yoshino, Eiichi; Matsuura, Kazuo; and Misaki, Hideo, 4,496,655, Cl. 435-191.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Nakamura, Keiichi; Inaguma, Yoshiharu; and Mori, Yutaka, 4,496,288, Cl. 417-213.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kato, Takaaki; Hirano, Yoshio; Ochiai, Takeshi; Ishikawa, Seizi; and Sakai, Kazunori, 4,497,057, Cl. 371-29.000.
Kobayashi, Nobuyuki; and Hattori, Takashi, 4,495,926, Cl. 123-486.000.
Shinoda, Kazuo; and Kobayashi, Nobuyuki, 4,495,915, Cl. 123-357.000.
Shinoda, Kazuo, 4,495,916, Cl. 123-387.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,496,134, Cl. 251-65.000.
Moriyama, Masakazu; and Saito, Takao, 4,496,996, Cl. 360-12.000.
Yasue, Hideki; and Fukumura, Kagenori, 4,495,830, Cl. 74-467.000.
Tranoco, Inc.: *See*—
Byars, Larry W.; and Jackson, Eric C., 4,496,421, Cl. 156-304.100.
Transpec, Inc.: *See*—
Sears, Ronald E., 4,495,731, Cl. 49-402.000.
Traub, Zeno P., to Eaton-Leonard Corporation. Multiple curvature bender. 4,495,788, Cl. 72-157.000.
Trobough, Douglas W.: *See*—
Helton, Raymond L.; Trobough, Douglas W.; and McPherson, Marianne, 4,496,438, Cl. 204-44.000.
True, Thomas T.; and Good, William E., to General Electric Company. Light valve projection system with improved vertical resolution. 4,496,969, Cl. 358-62.000.
Trussler, Ronald C.: *See*—
Eastcott, Peter D.; and Trussler, Ronald C., 4,496,883, Cl. 318-98.000.
Trutek Research, Inc.: *See*—
Brisson, Alfred; and Nowacki, Christopher, 4,495,944, Cl. 128-725.000.
Trutzschler GmbH & Co. KG: *See*—
Rosink, Albert, 4,495,677, Cl. 19-159.00R.
TRW Inc.: *See*—
Mathew, Moni G.; and Weisz, Thomas J., 4,496,915, Cl. 333-1.100.
Trzaska, Theodore T.: *See*—
McMorrow, Harold L.; and Trzaska, Theodore T., 4,496,256, Cl. 400-248.000.

Tsai, Yih-Wan, to PPG Industries, Inc. Target wall air jet for controlling combustion air. 4,496,316, Cl. 432-30.000.

Tsubouchi, Kaoru: *See*—
Furuta, Yohichi; Tsubouchi, Kaoru; and Nanamura, Kaoru, 4,495,772, Cl. 60-533.000.

Tsubouchi, Natsuro; and Denda, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. MOSFET Light detecting device having a Schottky junction. 4,496,964, Cl. 357-30.000.

Tsuchihashi, Genichi; Mitamura, Shuichi; Kitajima, Koji; and Kobayashi, Kumi, to Sagami Chemical Research Center. Optically active 1-(6-methoxy-2-naphthyl)-2-(alkoxycarbonyl) amino-1-propanone, its derivatives and their halo analogs and the methods for their manufacture. 4,496,755, Cl. 560-028.000.

Tsuda, Mikio: *See*—
Kawabe, Norio; Tsuda, Mikio; and Kobashi, Sadao, 4,496,647, Cl. 430-303.000.

Tsuei, Chang-Chyi: *See*—
Chi, Cheng-Chung J.; Davidson, Arthur; and Tsuei, Chang-Chyi, 4,496,854, Cl. 307-306.000.

Tsuji, Jiro; and Shimizu, Isao, to Nippon Zeon Co. Ltd. Process for production of α,β-unsaturated ketones. 4,496,766, Cl. 568-346.000.

Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,496,562, Cl. 514-207.000.

Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, to Fujitsu Limited. Hyperbolic navigation receiver. 4,496,951, Cl. 343-394.000.

Tsukada, Masaharu; Kimizuka, Junichi; and Shimizu, Haruo, to Canon Kabushiki Kaisha. Image recording apparatus. 4,496,238, Cl. 355-14.00D.

Tsukamoto, Tadashi: *See*—
Ishii, Sugao; Itou, Susumu; Kawamura, Mikio; and Tsukamoto, Tadashi, 4,496,063, Cl. 212-270.000.

Tuchiya, Yoshimasa; Chikaraishi, Takayo; and Kawamo, Kazunori, to Nissan Motor Company, Limited; and Nissan Shatai Company, Limited. Sealing structure for an automotive vehicle. 4,496,186, Cl. 296-146.000.

Tung, William C. T.: *See*—
Heater, Paul L., Jr.; Bletso, Nelson C.; and Tung, William C. T., 4,496,673, Cl. 523-458.000.

Tureaud, Aloysius K. Bowling aid device. 4,496,151, Cl. 273-54.00B.

Turley, Stephen E. H., to ITT Industries, Inc. Method of making a compound semiconductor laser. 4,496,403, Cl. 148-171.000.

Turner, Roger S. Semiconductor wafer sectioning machine. 4,495,732, Cl. 51-91.00R.

Turner, Weems D.: *See*—
Albert, James W.; and Turner, Weems D., 4,496,285, Cl. 417-12.000.

Tuthill, Frederick W. Tool holder. 4,496,088, Cl. 224-253.000.

Tweg, Edward. Collapsible paddle boat. 4,496,325, Cl. 440-26.000.

Tyler, Derek E.: *See*—
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,495,981, Cl. 164-452.000.
Kindlmann, Peter J.; Ungarean, Gary L.; Yarwood, John C.; and Tyler, Derek E., 4,495,983, Cl. 164-452.000.

Tyndale Plains-Hunter, Ltd.: *See*—
Gould, Francis E.; and Johnston, Christian W., 4,496,535, Cl. 424-19.000.

Tyrell, John A.: *See*—
Rosenquist, Niles R.; and Tyrell, John A., 4,496,693, Cl. 525-146.000.

Uchikawa, Naoshi: *See*—
Arai, Nobukatsu; Machida, Shigeru; Sato, Eiji; Tojo, Kenji; and Uchikawa, Naoshi, 4,496,296, Cl. 418-55.000.

Ueda, Syuji: *See*—
Nagata, Keiji; Ueda, Syuji; and Tanigawa, Yoshiyuki, 4,495,871, Cl. 108-20.000.

Ueno, Takashi; and Takase, Sadao, to Nissan Motor Company, Limited. Fuel injection control system for a direct injection type internal combustion engine. 4,495,924, Cl. 123-478.000.

Uetsuki, Masao: *See*—
Murata, Yoshifumi; Igi, Keishiro; Narukawa, Hiroshi; Uetsuki, Masao; Bando, Satoshi; Kawai, Shuji; and Shirano, Kenji, 4,496,714, Cl. 528-272.000.

Ultra Carbon Corporation: *See*—
Kusmierz, Marvin A.; and Pijaszek, Robert F., 4,496,828, Cl. 219-405.000.

UMC Industries, Inc.: *See*—
Allgeyer, David F., 4,496,201, Cl. 312-296.000.

Umemoto, Chiyuki; and Kohketsu, Kazuo, to Fuji Photo Film Co., Ltd. Noise erasing apparatus for stimulable phosphor sheet. 4,496,838, Cl. 250-327.200.

Umemoto, Makoto: *See*—
Yagihara, Morio; Hirano, Tsumoru; and Umemoto, Makoto, 4,496,650, Cl. 430-381.000.

Umezawa, Seiji: *See*—
Waki, Masahiko; Umezawa, Seiji; Takasugi, Tsuneji; Koide, Hiroshi; and Kasai, Takao, 4,496,248, Cl. 368-280.000.

Umino, Mitsugu, to Yoshida Kogyo K. K. Apparatus for manufacturing slide fastener having separable end stop. 4,495,695, Cl. 29-767.000.

Unarco Industries, Inc.: *See*—
Highsmith, Charles E., 4,496,061, Cl. 211-191.000.

Ungarean, Gary L.: *See*—
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,495,981, Cl. 164-452.000.
Kindlmann, Peter J.; Ungarean, Gary L.; Yarwood, John C.; and Tyler, Derek E., 4,495,983, Cl. 164-452.000.

Uni-Pump, Inc.: *See*—
Zuehlsdorf, James J., 4,496,077, Cl. 222-61.000.

Union Carbide Corporation: *See*—
Colon, Ismael, 4,496,700, Cl. 526-111.000.
Dehm, David C.; Hoy, Kenneth L.; and Hoy, Richard C., 4,496,708, Cl. 528-76.000.
D'Silva, Themistocles D. J., 4,496,721, Cl. 544-58.200.
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Moorehead, Eric L., 4,496,784, Cl. 585-486.000.

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Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,496,221, Cl. 350-349.000.

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Cattell, Alan F.; Cockayne, Brian; Wright, Peter J.; and Kirton, John, 4,496,610, Cl. 427-66.000.
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Ptasienski, Mitchell P.; Mustoe, Robert M.; and Zajonc, Fred H., deceased, 4,496,515, Cl. 264-504.000.

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Air Force: *See*—
Gnagy, Clayton C., 4,495,764, Cl. 60-255.000.
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Salour, Michael M.; and Fuchs, Adrian, 4,495,782, Cl. 62-514.00R.
Army: *See*—
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White, Harold V., 4,495,850, Cl. 89-1.800.
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Field, Michael E.; and Sullivan, William H., 4,495,807, Cl. 73-290.00R.
Mikesell, Charles R., 4,496,836, Cl. 250-231.00R.
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Cooke, Michael W.; Arriola, Arturo; Stegman, Julius M.; and Collins, Kenneth D., 4,495,849, Cl. 89-1.140.
Heller, Carl A.; Erickson, Eric D.; and Greni, Sterling R., 4,496,520, Cl. 422-60.000.
Higginbotham, Robert R.; and Malakhoff, Alexander, 4,495,809, Cl. 73-432.0SD.
Rozner, Alexander G.; Lenko, Daniel S.; and Carter, James H., 4,495,848, Cl. 89-1.100.
Savage, Howard T., 4,497,046, Cl. 367-169.000.
Woods, Charles E., 4,496,218, Cl. 350-267.000.
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Beckmann, Friedrich K.; Helzel, Thomas; and Peemoller, Horst, 4,496,202, Cl. 339-5.00R.
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Habelt, Gerhard; and Mucha, Franz, 4,496,257, Cl. 400-578.000.
Hermens, Joannes L. G.; and Kerkhof, Matheus W., 4,496,842, Cl. 250-385.000.
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Sanders, Rudolf; and Rijckaert, Josephus F., 4,496,874, Cl. 313-318.000.
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Sieben, Joannes H. F. C., 4,496,119, Cl. 242-198.000.
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University of California, The Regents of the: *See—*
Byers, Charles L., 4,495,917, Cl. 128-419.00R.

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Waite, J. Herbert, 4,496,397, Cl. 106-161.000.

University of Florida: *See—*
Lee, Hong H.; and Miller, Dennis J., 4,496,249, Cl. 374-7.000.

University of Illinois, The Board of Trustees of The: *See—*
Schrekeis, Josef; and Murphy, Gerard P., 4,496,165, Cl. 279-46.00R.

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Sandham, H. James; and Balanyk, Thomas E., 4,496,322, Cl. 433-217.000.

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Unsworth, Derek; and Diggs, Edward J. Land vehicles. 4,496,016, Cl. 180-53.600.

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Arena, Blaise J., 4,496,780, Cl. 568-861.000.
Barley, Geoffrey W., 4,496,190, Cl. 297-411.000.
DeFilippi, Louis J., 4,496,363, Cl. 8-115.500.
Kulkarni, Sudhir S.; and Kulprathipanja, Santi, 4,496,478, Cl. 260-97.600.
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Upjohn Company, The: *See—*
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Smith, Herman W., 4,496,742, Cl. 548-516.000.
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Urani, Angelo, to McGraw-Edison Company. Low current indicating fuse. 4,496,929, Cl. 337-265.000.

Urban, Manfred: *See—*
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USV Pharmaceutical Corporation: *See—*
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Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, 4,496,542, Cl. 514-2.000.

Valavaara, Viljo K., to Inventors Compendium International Corp. Hydrostatic transmissions. 4,495,768, Cl. 60-414.000.

Valeo: *See—*
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Rogier, Leonce, 4,496,017, Cl. 180-70.100.

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Ginardi, Jack L., 4,496,307, Cl. 431-34.000.

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Vas, Gerson M. F.; and Shiel, Leslie E., to Blue Circle Industries PLC. Coated particulate fillers comprises a phosphinic acid group-containing unsaturated organic polymer. 4,496,670, Cl. 523-205.000.

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Verley, Donald, to McCann's Engineering and Manufacturing Company. Combination lock for multiple faucets. 4,496,079, Cl. 222-129.100.

Vertenstein, Mathieu J.; and Amerigian, Albert A., to Silver Engineering Works, Inc. Pillow block assembly and sealing system therefor. 4,496,199, Cl. 384-474.000.

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Sugiyama, Hiroyuki, 4,496,992, Cl. 358-326.000.
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Vorbornik, Vaclay: *See—*
Junek, Jan; Vorbornik, Vaclay; Ripka, Josef; Jaros, Frantisek; Lihtarova , Ludmila; Hortlik, Frantisek; Kotrba, Zdenek; Rehackova, Bozena; and Dvorak, Ladislav, 4,495,762, Cl. 57-411.000.

Vozny, Valery F.: *See—*
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Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., 4,496,868, Cl. 310-112.000.

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W. C. Bradley Enterprises, Inc.: *See—*
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W. L. Gore & Associates, Inc.: *See—*
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W. R. Grace & Co.: *See—*
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W. R. Grace & Co., Cryovac Div.: *See—*
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W. Schlafhorst & Co.: *See*—
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Waber, Glenn R., to GNB Batteries Inc. Programmable control system for controlling at least two parameters in a predetermined sequence using both analog and digital control signals. 4,497,019, Cl. 364-132.000.

Wada, Yoshiyo; Goto, Kunio; and Kinjo, Hisao, to Victor Company of Japan, Ltd. Stylus for reproducing information signals recorded on a recording medium. 4,497,052, Cl. 369-126.000.

Waite, J. Herbert, to University of Connecticut. Process for purifying and stabilizing catechol-containing proteins and materials obtained thereby. 4,496,397, Cl. 106-161.000.

Waki, Masahiko; Umezawa, Seiji; Takasugi, Tsuneji; Koide, Hiroshi; and Kasai, Takao, to Citizen Watch Company Limited. Structure for a watch case made of cemented carbide. 4,496,248, Cl. 368-280.000.

Walker, James M., to Dril-Quip, Inc. Subsea wellhead connectors. 4,496,172, Cl. 285-18.000.

Walker, John G., to Bowthorpe-Hellermann Limited. Automatic tie gun. 4,495,972, Cl. 140-93.200.

Walker, Loren H.: *See*—
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Walker, Robert B.: *See*—
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Walker, Robert G., to Industra Products, Inc. Coil placing machine with readily convertible wedge making arrangement. 4,495,692, Cl. 29-564.100.

Wallat, Siegfried: *See*—
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Walsh, Thomas J.; Bachman, Robert; and Aderhold, Ronald, to Fiat Products Incorporated. Support leg assembly. 4,496,125, Cl. 248-188.000.

Walsh, Thomas J., to General Signal Corporation. Thermocouple open circuit detector. 4,496,250, Cl. 374-186.000.

Walstra, Hidde, to Texas Instruments Incorporated. Fuel supply system with electric choke and control therefor. 4,496,496, Cl. 261-39.00E.

Walton, Frank J., to GCA Corporation. Gas feed for reactive ion etch system. 4,496,423, Cl. 156-345.000.

Wandinger, Lothar; and Nalbandian, Vahakn, to United States of America, Army. Millimeter wave power combiner using concave reflectors. 4,496,913, Cl. 331-56.000.

Wang, Rong; and Merz, Martin D., to United States of America, Energy. Amorphous metal alloy and composite. 4,496,635, Cl. 428-680.000.

Wanie, Lee J., to Deere & Company. Neutralizing mechanism for a hydrostatic transmission. 4,496,035, Cl. 192-4.00C.

Wanish, Paul J.: *See*—
Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; Hankison, Ronald L.; Hao, Ming C.; Levin, Arthur L.; McClain, George A.; Wanish, Paul J.; and Zeitler, Carl, Jr., 4,497,022, Cl. 364-200.000.

Warco, Inc.: *See*—
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Ward, Anthony T.: *See*—
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Warner Electric Brake & Clutch Company: *See*—
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Warren, Craig B.: *See*—
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Washington Research Foundation: *See*—
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Washington University: *See*—
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Wasserman, Kurt J., to Phase Change Technology, Inc. Method of preventing frost damage of vegetation. 4,495,723, Cl. 47-2.000.

Watanabe, Masanori; Furubayashi, Hisatoshi; Tanaka, Junichi; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Moisture permeable electrode in a moisture sensor. 4,496,931, Cl. 338-34.000.

Watanabe, Yoshiaki: *See*—
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Waterman, George W.; and Dionne, Arthur F., to Standex International Corp. Tree stand. 4,496,129, Cl. 248-527.000.

Watson, Kenneth, to Westland plc. Helicopter rotors. 4,496,284, Cl. 416-138.000.

Wattron, Bernard: *See*—
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Wayne State University: *See*—
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Webasto-Werk W. Baier GmbH & Co.: *See*—
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Weber, Kent, to Sundstrand Corporation. High speed generator air vent for air gap. 4,496,862, Cl. 310-56.000.

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Weder, Donald E.: *See*—
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Weder, Erwin H.; Weder, Donald E.; and Weder, Herbert A., to Highland Manufacturing & Sales Company. Composition for decorative grass. 4,496,614, Cl. 428-7.000.

Weder, Herbert A.: *See*—
Weder, Erwin H.; Weder, Donald E.; and Weder, Herbert A., 4,496,614, Cl. 428-7.000.

Weeks, Benjamin R., to Texas Independent Tools and Unlimited Service, Inc. Method of and apparatus for setting a mechanical liner hanger by right-hand rotation. 4,496,000, Cl. 166-382.000.

Wehner, Gregor: *See*—
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Weingarten, Zvi. Sleeve valve with integral control chamber. 4,496,132, Cl. 251-5.000.

Weinhold, Karl. Device for connecting flanged pipes. 4,496,176, Cl. 285-365.000.

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Weisz, Thomas J.: *See*—
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Welch, Charles W.: *See*—
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Wellman, Donald C.: *See*—
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Wells, Henry A., to Champion International Corporation. Apparatus for paper tension control by measuring the frequency and flutter of a web. 4,496,428, Cl. 162-256.000.

Wenzel, Wolfgang D.; and Carmosino, Michael N., to Mobay Chemical Corporation. Viscosity stabilized dispersions. 4,496,678, Cl. 524-157.000.

Werstak, Charles E.: *See*—
Miller, Donald E.; Gilmore, Cecilia; Dimler, Steven R.; and Werstak, Charles E., 4,496,602, Cl. 426-555.000.

Wesbey, William H.: *See*—
Jensen, Gerald A.; Wesbey, William H.; and Riederer, Stephen J., 4,496,985, Cl. 358-111.000.

Wesch, Ludwig. Detection process and apparatus. 4,496,833, Cl. 250-211.00R.

West, Geoffrey A. W.; and Norton-Wayne, Leonard, to National Research Development Corporation. Detection apparatus. 4,496,971, Cl. 358-106.000.

Westeel-Rosco Limited-Westeel-Rosco Limitee: *See*—
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Western Progress, Inc.: *See*—
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Westinghouse Electric Corp.: *See*—
Martin, Donald G.; and York, Donald M., 4,496,933, Cl. 338-55.000.
Nadalin, Robert J.; and Charles, Robert G., 4,496,445, Cl. 204-158.00R.
Sattler, Frank A., 4,496,715, Cl. 528-288.000.
Sprengling, Gerhard R., 4,496,415, Cl. 156-283.000.
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Wey, Raymond: *See*—
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Weyer, Robert K., to EMF Corporation. Sheet feeder. 4,496,143, Cl. 271-112.000.

Wheeler, Ian R., to Ciba-Geigy Corporation. Production of azo compounds. 4,496,481, Cl. 534-579.000.

Wheeler, Richard J.: *See*—
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Whip-Mix Corporation: *See*—
Steinbock, Allen F., 4,496,319, Cl. 433-57.000.

Whipple, Raymond D., to United States of America, National Aeronautics and Space Administration. Extended moment arm anti-spin device. 4,496,122, Cl. 244-75.00R.

Whirlpool Corporation: *See*—
Cartier, Roger J.; Cuthbert, Victor W.; and Mason, Anthony, 4,495,960, Cl. 137-122.000.
Fleck, George J., 4,496,072, Cl. 220-432.000.
Khan, Aman U., 4,495,673, Cl. 16-232.000.

White, David J.: *See*—
Bowling, Donald R.; Kinman, Darry M.; Afendykiw, Marko; and White, David J., 4,497,030, Cl. 364-481.000.

White, Harold V., to United States of America, Army. Azimuth transfer scheme for a strapdown Inertial Measurement Unit. 4,495,850, Cl. 89-1.800.

Whitehouse, Daniel L., to Solarex Corporation. Antireflective coating composition. 4,496,398, Cl. 106-181.000.

Whitehurst Associates, Inc.: *See—*
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,465, Cl. 252-79.200.
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,466, Cl. 252-79.300.
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., to Whitehurst Associates, Inc.; and Encee Chemical Sales, Inc., a part interest. Wet-process phosphoric acid brightening reagent for aluminum. 4,496,465, Cl. 252-79.200.
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., to Whitehurst Associates, Inc.; and Encee Chemical Sales, Inc., a part interest. Wet-process phosphoric acid brightening reagent for aluminum. 4,496,466, Cl. 252-79.300.
Whitehurst, Garnett B.: *See—*
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,465, Cl. 252-79.200.
Whitehurst, Brooks M.; Clemens, Donald F.; King, Taylor; and Whitehurst, Garnett B., 4,496,466, Cl. 252-79.300.
Whittier Institute for Diabetes and Endocrinology, The: *See—*
Lewis, U. James, 4,496,521, Cl. 514-12.000.
Wible, John E.: *See—*
Melocik, Grant C.; and Wible, John E., 4,496,896, Cl. 320-2.000.
Wichinsky, Michael; and Gutknecht, LeRoy N. Coin projecting and target game apparatus. 4,496,160, Cl. 273-369.000.
Widner, Paul J.: *See—*
McCarthy, James R.; and Widner, Paul J., 4,496,725, Cl. 544-184.000.
Wienerberger Baustoffindustrie Aktiengesellschaft: *See—*
Linke, Walter; Kirnbauer, Peter; and Indra, Rudolf, 4,496,501, Cl. 264-37.000.
Wierenga, Wendell, to Upjohn Company, The. Substituted phenylalkyl compounds. 4,496,492, Cl. 260-456.00R.
Wiezer, Hartmut; and Pfahler, Gerhard. Polytriazinyl alcohols, esters and urethanes, a process for their preparation. 4,496,726, Cl. 544-198.000.
Wilcox, Roy D., to NL Industries, Inc. Method for determining optimum concentration of hydration inhibitor for clays in drilling fluids. 4,495,800, Cl. 73-61.400.
Wilke, Gerhard: *See—*
Heiser, Joachim; and Wilke, Gerhard, 4,496,289, Cl. 417-217.000.
Wilkinson Sword Limited: *See—*
Gatley, Derrick R., 4,496,047, Cl. 206-354.000.
Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine equipped for producing shaped seams. 4,495,877, Cl. 112-121.110.
Willi, Ernst, to Mottler Instrumente AB. Weighing apparatus including overload protection means. 4,496,014, Cl. 177-187.000.
William H. Rorer, Inc.: *See—*
Studt, William L.; and Zimmerman, Harry K., 4,496,573, Cl. 514-344.000.
Williams Lumber Yard: *See—*
Stark, Terry R., 4,495,884, Cl. 114-357.000.
Williams, Richard P., to United States of America, National Security Agency. Magnetic bubble logic apparatus. 4,497,042, Cl. 365-5.000.
Williams, Robert E., Jr.: *See—*
Florence, Robert A.; Campbell, John R.; and Williams, Robert E., Jr., 4,496,705, Cl. 528-34.000.
Williams, S. Keith. Electronic musical instrument. 4,495,846, Cl. 84-1.010.
Williams, Thomas C.: *See—*
Totten, George E.; and Williams, Thomas C., 4,496,482, Cl. 534-577.000.
Willimczik, Bernd: *See—*
Brandt, Joachim; Deblitz, Gerhard; Post, Jurgen; Willimczik, Bernd; Marten, Rolf; Paschen, Rolf; and Anderka, Gerold, 4,496,958, Cl. 346-139.00R.
Williner, Mario, to Minnesota Mining and Manufacturing Company. Infrared drying for water-impregnated photographic films. 4,495,713, Cl. 34-68.000.
Wilmoth, William C.: *See—*
Kowalski, Robert J.; and Wilmoth, William C., 4,495,705, Cl. 33-265.000.
Wilson, John C.; DeMejo, Lawrence P.; Jadwin, Thomas A.; and Merrill, Stewart H., to Eastman Kodak Company. Two-component dry electrostatic developer composition containing onium charge control agent. 4,496,643, Cl. 430-110.000.
Wilson, Stanley E.: *See—*
Edwards, Charles L.; and Wilson, Stanley E., 4,496,776, Cl. 568-827.000.
Winkler, Gert; Becker, Wilfried; and Zielinski, Erich, to Rheinmetall GmbH. Armor car-mounted mortar. 4,495,852, Cl. 89-46.000.
Winkless, Robert A.; and Kulesa, Edmund M., to Continental Can Company, Inc. Closure break-away tabs. 4,496,069, Cl. 220-260.000.
Winter, Roland A. E.: *See—*
Dexter, Martin; and Winter, Roland A. E., 4,496,676, Cl. 524-99.000.
Dexter, Martin; and Winter, Roland A. E., 4,496,757, Cl. 560-82.000.
Wisconsin Alumni Research Foundation: *See—*
Mistretta, Charles A.; Peppler, Walter W.; Kudva, Balakrishna V.; Hasegawa, Bruce H.; and Dobbins, James T., III, 4,497,062, Cl. 378-158.000.
Wisser, Edward F.: *See—*
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Wittle, John K.: *See—*
Titus, Charles H.; Wittle, John K.; and Bell, Christy W., 4,495,990, Cl. 166-65.00R.
Wohrle, Albert; and Krautzberger, Franz, to J. M. Voith GmbH. Coating mechanism. 4,495,888, Cl. 118-410.000.
Wolf, George: *See—*
Plotkin, George M.; Bendrick, Charles J.; and Wolf, George, 4,496,539, Cl. 424-94.000.
Wolf, Jerry M.; and Holben, Wilbur D., to Midwest-Acoust-A-Fiber, Inc. Sound absorption panel and method of making. 4,496,024, Cl. 181-292.000.
Wolff, Andrew M. Accurately tracking phonograph arm. 4,497,053, Cl. 369-244.000.
Wolff, David A.: *See—*
Oliver, Kirk D.; and Wolff, David A., 4,496,882, Cl. 315-371.000.
Woloski, Leonard E.; and Wyles, Walter E., to Lightolier Incorporated. Ceiling fixture having self-activating mounting means. 4,497,014, Cl. 362-150.000.
Wolter, Albrecht: *See—*
Steinbiss, Eberhard; Herchenbach, Horst; Ramesohl, Hubert; and Wolter, Albrecht, 4,496,396, Cl. 106-100.000.
Wong, Thomas M., to E. R. Squibb & Sons, Inc. Oleaginous emollient vehicle for steroid formulations. 4,496,554, Cl. 514-179.000.
Woods, Charles E., to United States of America, Navy. Hydraulic automatic light control. 4,496,218, Cl. 350-267.000.
Woodward, Donald W.: *See—*
Geist, Jacob M.; Vines, Harvey L.; Alvarez, Miguel R.; Rowles, Howard C.; and Woodward, Donald W., 4,496,382, Cl. 62-31.000.
Wooldridge, Lawson C., to Brockway Engineering Company Limited. Supporting assembly for troughing rolls of conveyor belts. 4,496,043, Cl. 198-827.000.
Wright, Peter J.: *See—*
Cattell, Alan F.; Cockayne, Brian; Wright, Peter J.; and Kirton, John, 4,496,610, Cl. 427-66.000.
Wright, Terry L., to Dow Chemical Company, The. Antiallergic (1H-tetrazol-5-yl)tetrazolo[1,5-a]quinolines and derivatives thereof. 4,496,569, Cl. 514-311.000.
Wuerzer, Bruno: *See—*
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, 4,496,391, Cl. 71-92.000.
Wunderwald, Peter: *See—*
Lill, Helmut; Schrenk, Jurgen; and Wunderwald, Peter, 4,496,653, Cl. 435-7.000.
Wurdack, Gerard A.; and Morgan, Gene L., to Gerard A. Wurdack & Associates, Inc. Antenna rotator controller. 4,496,890, Cl. 318-600.000.
Wyber, James P.: *See—*
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., 4,496,768, Cl. 568-454.000.
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., 4,496,769, Cl. 568-454.000.
Wyles, Walter E.: *See—*
Woloski, Leonard E.; and Wyles, Walter E., 4,497,014, Cl. 362-150.000.
Wynn, Stephen R., to General Electric Company. Phase locked loop with oscillator blocking for improved acquisition time. 4,496,912, Cl. 331-1.00A.
Xerox Corporation: *See—*
Biegelsen, David K.; and Sirkin, Eric R., 4,496,608, Cl. 427-53.100.
Bugatto, Henry, Jr., 4,496,892, Cl. 318-696.000.
Fischbeck, Kenneth H., 4,496,960, Cl. 346-140.00R.
Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., 4,496,233, Cl. 355-3.0TR.
Perun, William D.; and Garavuso, Gerald M., 4,496,144, Cl. 271-114.000.
Schram, Joseph G., 4,496,234, Cl. 355-3.0FU.
Schron, Steven M., 4,496,237, Cl. 355-14.00C.
Smith, Thomas W.; Cheng, David; and Ward, Anthony T., 4,496,957, Cl. 346-135.100.
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Xolox Corporation: *See—*
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Yabuuchi, Shigeru; Endoh, Takeyuki; Kodama, Kazuyuki; and Ide, Jushi, to Hitachi, Ltd. Method of generating time delay. 4,497,035, Cl. 364-577.000.
Yaegashi, Takashi: *See—*
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Nunomura, Shigeki; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,496,584, Cl. 514-510.000.
Yagihara, Morio; Hirano, Tsumoru; and Umemoto, Makoto, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,496,650, Cl. 430-381.000.
Yagodin, Valery M.: *See—*
Nikolsky, Vladimir A.; Yagodin, Valery M.; Vazhnov, Evgeny N.; Bondar, Efim S.; Naumenko, Igor P.; Vozny, Valery F.; Orlov, Vladimir N.; and Tikhonov, Vladimir I., 4,495,776, Cl. 62-114.000.
Yajima, Tsunao: *See—*
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Yamabe, Shigeru: *See—*
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Yamada, Kazuji: *See*—
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Yamada, Kinsaku: *See*—
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Yamada, Shunsuke; Kawate, Kenji; Ono, Takashi; Arakawa, Hideo; and Suda, Tsuyoshi, to Daidotokushuko Kabushikikaisha. Heat-treatment system and process. 4,496,312, Cl. 432-11.000.
Yamagata, Selichi: *See*—
Nakayama, Takashi; Kajita, Kohji; and Yamagata, Selichi, 4,495,761, Cl. 57-328.000.
Yamaguchi, Kinya: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Nanba, Yasuhiro; Gotoh, Takayuki; Yamakawa, Eiji; and Karasaki, Toshihiko, 4,496,834, Cl. 250-211.00R.
Yamamoto, Sakuei; Nishida, Mitsuhiro; Tashiro, Noboru; and Sonoda, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Submersible electric motor and method of manufacturing the same. 4,496,866, Cl. 310-87.000.
Yamamoto, Tamio; Kobayashi, Tsukasa; Hirakawa, Tadashi; Yoshida, Makoto; and Okumura, Masumi, to Teijin Limited. Paper-like polyester fiber sheet and process for producing the same. 4,496,583, Cl. 428-288.000.
Yamamoto, Toshiki. Method and apparatus for pressing seams open on sewing machines. 4,495,879, Cl. 112-217.000.
Yamamura, Michael M., to Rockwell International Corporation. High voltage level detector and method. 4,496,855, Cl. 307-350.000.
Yamanaka, Seisuke: *See*—
Sase, Masatoshi; Onga, Makoto; and Yamanaka, Seisuke, 4,496,967, Cl. 358-44.000.
Yamashiki, Yutaka: *See*—
Fukuda, Joji; and Yamashiki, Yutaka, 4,497,021, Cl. 364-200.000.
Yamashita, Keitaro; and Kashiwagi, Hiromi, to Hitachi Metals, Ltd. Apparatus for controlled delivery of magnetic toner. 4,496,240, Cl. 355-14.00D.
Yamashita, Toshiaki: *See*—
Sumita, Manabu; and Yamashita, Toshiaki, 4,496,871, Cl. 310-324.000.
Yamato, Akihiro, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling the operation of an internal combustion engine at the start of same. 4,495,927, Cl. 123-491.000.
Yanagisawa, Saburo; and Yonemori, Yoshinori. Constant speed running device for automobile. 4,495,912, Cl. 123-350.000.
Yanagishima, Takayuki: *See*—
Seko, Yasutoshi; Yanagishima, Takayuki; and Inoue, Masami, 4,496,938, Cl. 340-576.000.
Yancey, Herbert W.: *See*—
Shaheen, Joseph M.; and Yancey, Herbert W., 4,496,215, Cl. 350-96.230.
Yang, John P., to Lockheed Electronics Co., Inc. Self-clocking binary receiver. 4,497,060, Cl. 375-22.000.
Yang, Wei-Yeih W.; and Okamoto, Yoshihisa, to B. F. Goodrich Company, The. Process using supercooled liquid lactam mixtures. 4,496,514, Cl. 264-328.600.
Yang, Wen-Jei. Apparatus for injection molding a foamed resin product having a smooth surface involving surface heating of the mold by applying high current low voltage electric power. 4,496,131, Cl. 249-78.000.
Yankovsky, Alexei J.: *See*—
Advolotkin, Nikolai P.; Belyaeva, Svetlana A.; Ovchinnikov, Igor E.; Lebedev, Nikolai I.; Yankovsky, Alexei J.; Sytykh, Stanislav P.; Khrenov, Jury A.; and Axenov, Vladimir N., 4,496,868, Cl. 310-112.000.
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Yarbrough, Don L., to Deere & Company. Threshing concave filler strip retainer. 4,495,954, Cl. 130-27.00K.
Yarwood, John C.: *See*—
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Kindlmann, Peter J.; Ungarean, Gary L.; Yarwood, John C.; and Tyler, Derek E., 4,495,983, Cl. 164-452.000.
Yasuda, Yasuo. Stapler. 4,496,091, Cl. 227-123.000.
Yasue, Hideki; and Fukumura, Kagenori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic transmission for a vehicle. 4,495,830, Cl. 74-467.000.
Yazar, M. Nihat, to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence. Electroexplosives, rf power safety margin measurement method. 4,496,901, Cl. 324-95.000.
Yellin, Tobias O.; and Gilman, David J., to ICI Americas Inc.; and Imperial Chemical Industries PLC. Amide derivatives. 4,496,564, Cl. 514-237.000.
Yellin, Tobias O.; Gilman, David J.; Edwards, Philip N.; Large, Michael S.; Jones, Derrick F.; and Oldham, Keith, to ICI Americas Inc.; and Imperial Chemical Industries, PLC. Histamine H2-antagonists. 4,496,571, Cl. 514-340.000.
Yokogawa Hokushin Electric Corporation: *See*—
Ikeda, Kyoichi; Harada, Kinji; and Isozaki, Katsumi, 4,495,818, Cl. 73-702.000.
Miura, Shigetaka; Igawa, Junichi; and Takata, Satoru, 4,496,902, Cl. 324-150.000.
Yokoo, Hidejiro: *See*—
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Yokota, Mitsuyoshi: *See*—
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Yokoyama, Tadashi: *See*—
Suzuki, Masaru; Iwata, Masayosi; Hayashi, Yoshikazu; and Yokoyama, Tadashi, 4,496,810, Cl. 200-61.540.
Yonemori, Yoshinori: *See*—
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Yonkers, E. Hubbard: *See*—
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Yoshida Industry Co., Ltd.: *See*—
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Yoshida, Isamu: *See*—
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Yoshida Kogyo K. K.: *See*—
Fisher, Harry; and Fisher, Stuart, 4,495,686, Cl. 29-409.000.
Umino, Mitsugu, 4,495,695, Cl. 29-767.000.
Yoshida, Makoto: *See*—
Yamamoto, Tamio; Kobayashi, Tsukasa; Hirakawa, Tadashi; Yoshida, Makoto; and Okumura, Masumi, 4,496,583, Cl. 428-288.000.
Yoshida, Mamoru; Yokoo, Hidejiro; and Shirai, Ei, to Showa Denko Kabushiki Kaisha. Powdered or granular solid pesticide composition. 4,496,585, Cl. 514-514.000.
Yoshida, Mitsuo; and Shiroki, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Hydrogen-evolution electrode. 4,496,453, Cl. 204-290.00R.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,496,993, Cl. 358-335.000.
Yoshihara, Setsuo; Otsubo, Yorihumi; and Kobayashi, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ticket checking apparatus. 4,496,830, Cl. 235-458.000.
Yoshikumi, Chikao: *See*—
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Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,496,574, Cl. 514-195.000.
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Yoshinaga, Minoru; and Sumida, Atsushi, to Toray Industries, Inc. Continuous carbon filament fiber bundles. 4,496,671, Cl. 523-206.000.
Yoshino, Eiichi; Matsuura, Kazuo; and Misaki, Hideo, to Toyo Jozo Kabushiki Kaisha. Process for the production of tyramine oxidase. 4,496,655, Cl. 435-191.000.
Yoshino Kogyosho Co. Ltd.: *See*—
Kinoshita, Harumi; Kushida, Hideo; Itakura, Takeshi; Akutsu, Masao; Takada, Takuzo; and Sugiura, Hiroaki, 4,496,517, Cl. 264-521.000.
Yoshizawa, Yoshikazu: *See*—
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Yoskikawa, Kuniyoshi: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; Yoskikawa, Kuniyoshi; and Mito, Masazi, 4,495,693, Cl. 29-571.000.
Young, John B.: *See*—
Nikkel, Willem A.; and Young, John B., 4,495,890, Cl. 118-674.000.
Young, John K.; and Barthel, Alfred, to Union Carbide Corporation. Shipping container for storing materials at cryogenic temperatures. 4,495,775, Cl. 62-48.000.
Young, John S., to Gte Automatic Electric Inc. Ringing generator testing arrangement for a digital telephone network. 4,496,800, Cl. 179-175.20R.
Young, Leo, to United States of America, Navy. Frequency-spreading coupler. 4,496,876, Cl. 315-4.000.
Young, Peter L., to Sperry Corporation. Method of making high reliability lead-alloy Josephson junction. 4,496,648, Cl. 430-312.000.
Youssefyeh, Raymond D.: *See*—
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, 4,496,542, Cl. 514-2.000.
Yu, Hong; and Kwok, Sai W., to Casat Technology, Inc. FM High-fidelity processor. 4,496,979, Cl. 358-197.000.
Yuasa, Kazuhiro; Takahashi, Shuichi; and Kondo, Mitsuru, to Ricoh Company, Ltd. Conversion of an analog image signal into a binary image signal. 4,496,987, Cl. 358-283.000.
Yuille, James D.: *See*—
Tessarzik, Juergen M.; Myers, Albert; and Yuille, James D., 4,495,810, Cl. 73-432.00R.
Yunan, Malak E.: *See*—
Mitchell, Hardin D., Jr.; and Yunan, Malak E., 4,495,867, Cl. 102-275.400.

Zagefka, Hans-Dieter; Bartz, Wilfried; and Konietzny, Alfred, to Chemische Werke Huls AG. Aqueous media for the treatment of wood and wooden materials and a process for such treatment. 4,496,613, Cl. 427-440.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Tischer, Werner; Liebert, Karl-Heinz; and Fassbender, Rolf, 4,495,769, Cl. 60-451.000.

Zajonc, Fred H., deceased: *See*—
Ptasienski, Mitchell P.; Mustoe, Robert M.; and Zajonc, Fred H., deceased, 4,496,515, Cl. 264-504.000.

Zajonc, Margaret S., executrix: *See*—
Ptasienski, Mitchell P.; Mustoe, Robert M.; and Zajonc, Fred H., deceased, 4,496,515, Cl. 264-504.000.

Zanchuk, Walter A.: *See*—
Greskovich, Eugene J.; and Zanchuk, Walter A., 4,495,874, Cl. 110-347.000.

Zeitler, Carl, Jr.: *See*—
Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; Hankison, Ronald L.; Hao, Ming C.; Levin, Arthur L.; McClain, George A.; Wanish, Paul J.; and Zeitler, Carl, Jr., 4,497,022, Cl. 364-200.000.

Zenitani, Hideki; Oka, Akira; Okamoto, Itsuo; Hayashi, Hisao; and Taniguchi, Masajiro, to Fujitsu Limited. Rack structure for mounting a communication apparatus. 4,496,057, Cl. 211-26.000.

Zenith Electronics Corporation: *See*—
Kueny, Cindee C., 4,496,877, Cl. 315-15.000.

Zielinski, Erich: *See*—
Winkler, Gert; Becker, Wilfried; and Zielinski, Erich, 4,495,852, Cl. 89-46.000.

Zimmerman, Harry K.: *See*—
Studt, William L.; and Zimmerman, Harry K., 4,496,573, Cl. 514-344.000.

Zinck, Eugen. Compressed-air pile-driver. 4,496,007, Cl. 173-127.000.

Zones, Stacey I.: *See*—
Santilli, Donald S.; and Zones, Stacey I., 4,496,786, Cl. 585-640.000.

Zsolnay, Andrew; Perkins, Kelly M.; and Blad, Leiv H., to Lockheed Corporation. Automatic process control system for curing polymeric material. 4,496,697, Cl. 526-60.000.

Zuehlsdorf, James J., to Uni-Pump, Inc. Leak detector monitor for pressurized flow systems. 4,496,077, Cl. 222-61.000.

Zwiep, Theodore C.: *See*—
Keller, Frederick P.; and Zwiep, Theodore C., 4,496,332, Cl. 464-89.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JANUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alfano, Robert R., to Philips Medical Systems, Inc. Method and apparatus for detecting the presence of caries in teeth using visible luminescence. Re. 31,815, Cl. 128-665.000.

Campbell, Glenn M.: *See*—
Weiss, Verne E.; Campbell, Glenn M.; and Wilson, Gerald L., Re. 31,819, Cl. 426-439.000.

Clonch, David, to S & S Corporation. Feeder crusher. Re. 31,818, Cl. 241-101.700.

General Electric Company: *See*—
Litch, Ernest W., III, Re. 31,820, Cl. 219-93.000.

General Mills, Inc.: *See*—
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Yugen Kaisha Fuji Seisakusho: *See*—
Yamada, Teruo, 277,386, Cl. D15-146.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
Christensen, Jack E., 5,397, Cl. 7.000.
Christensen, Jack E.; and Swim, Herbert C., 5,398, Cl. 11.000.
Christensen, Jack E.; and Swim, Herbert C., 5,399, Cl. 22.000.
Christensen, Jack E., to Armstrong Nurseries, Inc. Miniature rose plant cv Aroprawn. 5,397, 1-29-85, Cl. 7.000.
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Conard-Pyle Company, The: *See*—
Meilland, Marie L., 5,396, Cl. 2.000.
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Swim, Herbert C.: *See*—
Christensen, Jack E.; and Swim, Herbert C., 5,398, Cl. 11.000.
Christensen, Jack E.; and Swim, Herbert C., 5,399, Cl. 22.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 29, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

10 4,495,657
49 R 4,495,658
66 4,495,659
91 4,495,660
97 4,495,661
211 4,495,662
422 4,495,663

CLASS 3

1.913 4,495,664
13 4,495,665

CLASS 4

564 4,495,666

CLASS 8

115.5 4,496,363
641 4,496,364

CLASS 15

53 A 4,495,667
105 4,495,668
143 R 4,495,669
236 R 4,495,670

CLASS 16

87 R 4,495,671
229 4,495,672
232 4,495,673
302 4,495,674

CLASS 17

1 G 4,495,675
25 4,495,676

CLASS 19

159 R 4,495,677

CLASS 24

113 R 4,495,678
414 4,495,679

CLASS 28

100 4,495,680

CLASS 29

26 A 4,495,681
33 M 4,495,682
119 4,495,683
156.5 R 4,495,684
402.08 4,495,685
409 4,495,686
426.1 4,495,687
460 4,495,688
468 4,495,689
4,495,690
527.5 4,495,691
564.1 4,495,692
571 4,495,693
4,495,694
767 4,495,695

CLASS 30

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294 4,495,697
357 4,495,698
360 4,495,699

CLASS 33

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166 4,495,701
169 R 4,495,702
174 L 4,495,703
180 R 4,495,704
265 4,495,705
333 4,495,706
392 4,495,707
438 4,495,708
484 4,495,709

CLASS 34

10 4,495,710
23 4,495,711
52 4,495,712
68 4,495,713
111 4,495,714

CLASS 36

113 4,495,715

CLASS 37

3 4,495,716
117.5 4,495,717

CLASS 40

152.2 4,495,718
590 4,495,719

CLASS 42

7 4,495,720

CLASS 43

21.2 4,495,721
42.39 4,495,722

CLASS 44

1 D 4,496,365
14 4,496,366
51 4,496,367
63 4,496,368

CLASS 47

2 4,495,723
57.6 4,495,724
85 4,495,725

CLASS 48

92 4,496,369
197 R 4,496,370
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CLASS 49

56 4,495,727
141 4,495,728
212 4,495,729
280 4,495,730
401 4,495,726
402 4,495,731

CLASS 51

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165 R 4,495,733
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309 4,496,372

CLASS 52

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173 DS 4,495,737
204 4,495,738
308 4,495,739
309.1 4,495,740
404 4,495,741
407 4,495,742
478 4,495,743
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CLASS 53

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389 4,495,746
412 4,495,747
449 4,495,748
471 4,495,749
575 4,495,750
576 4,495,751

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24 4,495,752
4,495,753

CLASS 55

16 4,496,373
84 4,496,374
131 4,496,375
163 4,496,376
287 4,496,377
316 4,496,378
387 4,496,379

CLASS 56

11.9 4,495,754
364 4,495,755
4,495,756

CLASS 57

5 4,495,757
19 4,495,758
58.52 4,495,759
211 4,495,760
328 4,495,761
411 4,495,762

CLASS 60

242 4,495,763
255 4,495,764
398 4,495,765
414 4,495,768
428 4,495,766
436 4,495,767
451 4,495,769
486 4,495,770
525 4,495,771
533 4,495,772
605 4,495,773
649 4,495,774

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24 4,496,380
30 4,496,381
31 4,496,382
4,496,383
48 4,495,775
114 4,495,776
185 4,495,777
209 4,495,778
211 4,495,779
229 4,495,780
260 4,495,781
514 R 4,495,782

CLASS 65

4.4 4,496,384
9 4,496,385
106 4,496,386
335 4,496,387

CLASS 68

5 D 4,495,783
23.6 4,495,784
62 4,495,785

CLASS 70

186 4,495,786
258 4,495,787

CLASS 71

76 4,496,388
86 4,496,389
92 4,496,390
4,496,391
93 4,496,392

CLASS 72

157 4,495,788
302 4,495,789
326 4,495,790
453.02 4,495,791

CLASS 73

12 4,495,792
23 4,495,793
37.5 4,495,794
38 4,495,795
4,495,796
40 4,495,797
54 4,495,798
61 R 4,495,799
61.4 4,495,800
117 4,495,801
118 4,495,802
151 4,495,803
152 4,495,804
155 4,495,805
182 4,495,806
290 R 4,495,807
432 R 4,495,808
4,495,810
432 SD 4,495,809
462 4,495,811
468 4,495,812
490 4,495,813
514 4,495,814
517 B 4,495,815
600 4,495,816
624 4,495,817
702 4,495,818
705 4,495,819
724 4,495,820
753 4,495,821
861.27 4,495,822
861.76 4,495,823
862.64 4,495,824

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89.18 4,495,827
110 4,495,828
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715 4,495,834
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751 4,495,836
869 4,495,837
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CLASS 75

58 4,496,393
63 4,496,394
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CLASS 81

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430 4,495,841

CLASS 82

4 R 4,495,842
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CLASS 83

715 4,495,844
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CLASS 84

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CLASS 89

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6.5 4,495,851
46 4,495,852
4,495,853

CLASS 91

438 4,495,854

CLASS 92

71 4,495,855
125 4,495,856

CLASS 98

6 4,495,857
38.1 4,495,858
59 4,495,859

CLASS 99

340 4,495,860
422 4,495,861

CLASS 100

34 4,495,862

CLASS 101

350 4,495,863
365 4,495,864
415.1 4,495,865

CLASS 102

202 4,495,866
275.4 4,495,867
357 4,495,868
503 4,495,869
511 4,495,870

CLASS 106

100 4,496,396
161 4,496,397
181 4,496,398

CLASS 108

20 4,495,871

CLASS 110

190 4,495,872
250 4,495,873
347 4,495,874

CLASS 111

7 4,495,875

CLASS 112

103 4,495,876
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357 4,495,884

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29 4,495,893
51 R 4,495,894
52 AF 4,495,895
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148 4,495,897
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90.38 4,495,903
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179 G 4,495,904
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193 C 4,495,907
195 C 4,495,908
196 R 4,495,909
198 B 4,495,910
198 R 4,495,911
350 4,495,912
352 4,495,913
357 4,495,914
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480 4,495,925
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491 4,495,927
557 4,495,928
569 4,495,929
575 4,495,930
651 4,495,931

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204 4,495,935
426 4,495,936
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439 4,495,938
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80 H 4,495,942
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207.15 4,495,948
419 R 4,495,917
664 4,495,949
665 Re.31,815
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CLASS 131

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CLASS 132

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CLASS 137

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117 4,495,962
122 4,495,960
351 4,495,963
512.1 4,495,964
599 4,495,965
614.01 4,495,966
614.06 4,495,967
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625.17 4,495,969

CLASS 138

148 4,495,970

CLASS 139

435 4,495,971

CLASS 140

93.2 4,495,972
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CLASS 141

132 4,495,974
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CLASS 148

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6.15 R 4,496,399
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31.57 4,496,402
171 4,496,403

CLASS 149

2 4,496,405

CLASS 152

354 R 4,495,976

CLASS 156

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73.5 4,496,408
84 4,496,410
85 4,496,409
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157 4,496,412
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345 4,496,423
361 4,496,417
601 4,496,424
626 4,496,425
643 4,496,418
4,496,419
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CLASS 160

70 4,495,977
117 4,495,978
226 4,495,979

CLASS 162

19 4,496,426
157.5 4,496,427
256 4,496,428
358 4,496,429

CLASS 164

16 4,495,980
452 4,495,981
4,495,982
4,495,983
468 4,495,984

CLASS 165

1 4,495,985
2 4,495,986
70 4,495,987
96 4,495,988
172 4,495,989

CLASS 166

65 R 4,495,990
250 4,495,991
4,495,992
261 4,495,993
4,495,994
273 4,495,995
279 4,495,996
285 4,495,997
321 4,495,998
364 4,495,999
382 4,496,000
387 4,496,001

CLASS 168

4 4,496,002

CLASS 171

63 4,496,003

CLASS 172

311 4,496,004
395 4,496,005

CLASS 173

28 4,496,006
127 4,496,007

CLASS 174

22 C 4,496,789
48 4,496,790
51 4,496,791
65 R 4,496,792
68.5 4,496,793
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84 R 4,496,795
101.5 4,496,796

CLASS 175

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4.55 4,496,010
4.6 4,496,008
19 4,496,011
65 4,496,012
374 4,496,013

CLASS 177

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CLASS 179

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100 L 4,496,799
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175.3 R 4,496,801

CLASS 180

9.26 4,496,015
53.6 4,496,016
70.1 4,496,017
78 4,496,018
215 4,496,019
219 4,496,020

CLASS 181

152 4,496,021
175 4,496,022
230 4,496,023
292 4,496,024

CLASS 182

121 4,496,025
128 4,496,026
142 4,496,027
186 4,496,028
222 4,496,029

CLASS 184

45 R 4,496,030

CLASS 187

9 R 4,496,031

CLASS 188

180 4,496,032
347 4,496,033

CLASS 192

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4 C 4,496,035
106.2 4,496,036

CLASS 193

2 R 4,496,037

CLASS 198

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396 4,496,039
434 4,496,040
457 4,496,041
774 4,496,042
827 4,496,043

CLASS 200

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5 R 4,496,802
11 A 4,496,804
11 TC 4,496,805
16 R 4,496,806
61.42 4,496,807
61.45 R 4,496,808
4,496,809
61.54 4,496,810
86.5 4,496,811
159 B 4,496,812
314 4,496,813

CLASS 202

83 4,496,431
158 4,496,430

CLASS 204

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11 4,496,434
15 4,496,435
23 4,496,436
24 4,496,437
44 4,496,438
55 R 4,496,439
78 4,496,440
98 4,496,441
129 4,496,442
130 4,496,443
148 4,496,444
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159.14 4,496,446
159.16 4,496,447
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4,496,449
192 R 4,496,450
252 4,496,451
266 4,496,452
290 R 4,496,453
402 4,496,454
412 4,496,455

CLASS 206

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63.3 4,496,045
219 4,496,046
354 4,496,047
387 4,496,048
395 4,496,049
444 4,496,050
459 4,496,051
470 4,496,052
510 4,496,053
586 4,496,054

CLASS 208

33 4,496,456

CLASS 209

3.1 Re.31,817
223 R 4,496,457
536 4,496,055
539 4,496,056

CLASS 210

90 4,496,458
132 4,496,460
198.2 4,496,461
232 4,496,462
310 4,496,459
341 4,496,463
792 4,496,464

CLASS 211

26 4,496,057
86 4,496,058
105.1 4,496,059
124 4,496,060
191 4,496,061

CLASS 212

189 4,496,062
270 4,496,063

CLASS 215

1 C 4,496,064
207 4,496,065
320 4,496,066

CLASS 219

10.55 E 4,496,815
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10.55 F 4,496,814
10.55 M 4,496,817
10.57 4,496,818
10.81 4,496,819
87 4,496,820
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116 4,496,821
125.1 4,496,822
137.41 4,496,823
216 4,496,824
222 4,496,825
272 4,496,826
399 4,496,827
405 4,496,828
497 4,496,829

CLASS 220

3.7 4,496,067
4 D 4,496,068
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306 4,496,070
319 4,496,071
432 4,496,072
445 4,496,073

CLASS 221

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CLASS 222

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61 4,496,077
87 4,496,078
129.1 4,496,079
129.3 4,496,080
135 4,496,081
153 4,496,082
231 4,496,083
282 4,496,084
321 4,496,085
412 4,496,086
638 4,496,087

CLASS 224

253 4,496,088
329 4,496,089

CLASS 225

65 4,496,276

CLASS 227

19 4,496,090
123 4,496,091
149 4,496,092

CLASS 228

49 B 4,496,093
56 4,496,094
102 4,496,095
107 4,496,096
212 4,496,097
219 4,496,098

CLASS 235

458 4,496,830
472 4,496,831

CLASS 237

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CLASS 238

10 R 4,496,100

CLASS 239

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230 4,496,103
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CLASS 241

32 4,496,105
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55 4,496,111
66 4,496,112
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527 4,496,129
585 4,496,130

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327.2 4,496,838
341 4,496,839
343 4,496,840
374 4,496,841
385 4,496,842
426 4,496,843
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7 4,496,133
65 4,496,134
308 4,496,135

CLASS 252

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79.2 4,496,465
79.3 4,496,466
92 4,496,467
181 4,496,470
186.21 4,496,471
186.22 4,496,472
186.41 4,496,473
311.5 4,496,474
514 4,496,475
522 R 4,496,476
629 4,496,477

CLASS 254

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239 BF 4,496,483
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351.1 4,496,485
403 4,496,486
404 4,496,487
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456 R 4,496,492
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95 4,496,498

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109 4,496,506
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514 4,496,516
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CLASS 269

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CLASS 270

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55 4,496,141

CLASS 271

3 4,496,142
112 4,496,143
114 4,496,144
122 4,496,145

CLASS 272

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153 S 4,496,155
184 B 4,496,156
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249 4,496,327
312 4,496,158
341 4,496,159
369 4,496,160

CLASS 277

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9.5 4,496,162

CLASS 279

1 A 4,496,163
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CLASS 280

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612 4,496,168
615 4,496,169
801 4,496,170

CLASS 283

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CLASS 285

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24 4,496,173
53 4,496,174
334 4,496,175
365 4,496,176

CLASS 290

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44 4,496,846
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55 4,496,848

CLASS 292

87 4,496,177
169.13 4,496,178

CLASS 294

26 4,496,179
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78 R 4,496,181
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CLASS 295

7 4,496,183

CLASS 296

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106 4,496,185
146 4,496,186
182 4,496,187
190 4,496,188

CLASS 297

63 4,496,189
118 4,495,887
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CLASS 299

17 4,496,191

CLASS 303

13 4,496,192
19 4,496,193

CLASS 307

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270 4,496,853
306 4,496,854
350 4,496,855
475 4,496,856
4,496,857
519 4,496,858
520 4,496,859
542 4,496,860
602 4,496,861

CLASS 308

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6 C 4,496,195
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4,496,198

CLASS 310

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61 4,496,863
77 4,496,864
80 4,496,865
87 4,496,866
93 4,496,867
112 4,496,868
172 4,496,869
260 4,496,870
324 4,496,871

CLASS 312

208 4,496,200
296 4,496,201

CLASS 313

113 4,496,872
231.71 4,496,873
318 4,496,874
632 4,496,875

CLASS 315

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15 4,496,877
73 4,496,878
169.4 4,496,879
228 4,496,880
357 4,496,881
371 4,496,882

CLASS 318

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122 4,496,885
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565 4,496,889
600 4,496,890
696 4,496,891
4,496,892
721 4,496,893
759 4,496,894
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CLASS 320

2 4,496,896

CLASS 322

25 4,496,897
34 4,496,898

CLASS 323

207 4,496,899

CLASS 324

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95 4,496,901
150 4,496,902
158 F 4,496,903
227 4,496,904
414 4,496,905
439 4,496,906
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